Mining CONGRESS JOURNAL

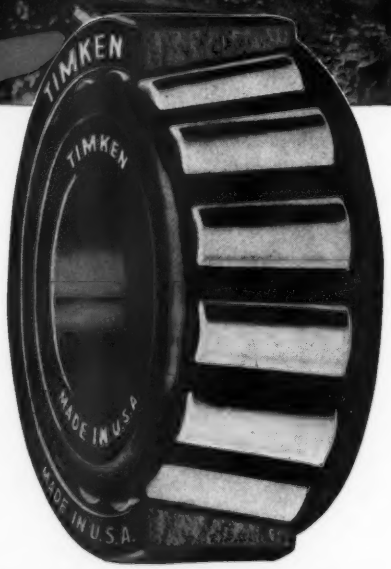
THE AMERICAN MINING CONGRESS

JANUARY
1947

A Heavy Trip Rolls Easily On TIMKEN BEARINGS

At the new Robin Hood Mine of Princess Dorothy Coal Company . . . . .

WARNING: Look for the Trade-Mark "TIMKEN" on every bearing you use.



Robin Hood Mine is located in Boone County, W. Va. It is a new property, having been in production only little more than a year.

All cars used in this mine are of the drop bottom type built by American Car & Foundry Company. There are 50 large cars like those shown in the photograph and 50 smaller cars, all equipped with Timken Tapered Roller Bearings. A good idea of the size and capacity of the large cars is afforded by comparison of the cars with the men in the picture.

Princess Dorothy Coal Company, Eunice, W. Va. has operated Timken Bearing Equipped mine cars for years, hence their selection of Timken Bearings for the Robin Hood Mine. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Mining Congress Journal

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FRONT COVER:

Coal stripping the Bradley Mine near Barnesville, Ohio, is this Allis-Chalmers HD-14 Diesel crawler pulling an 11-yd. Gar Wood scraper. Owner Walt Shaull of Harrisburg, Pa., reveals that his crawler tractors have uncovered 60,000 tons of bituminous coal during two months of operation.

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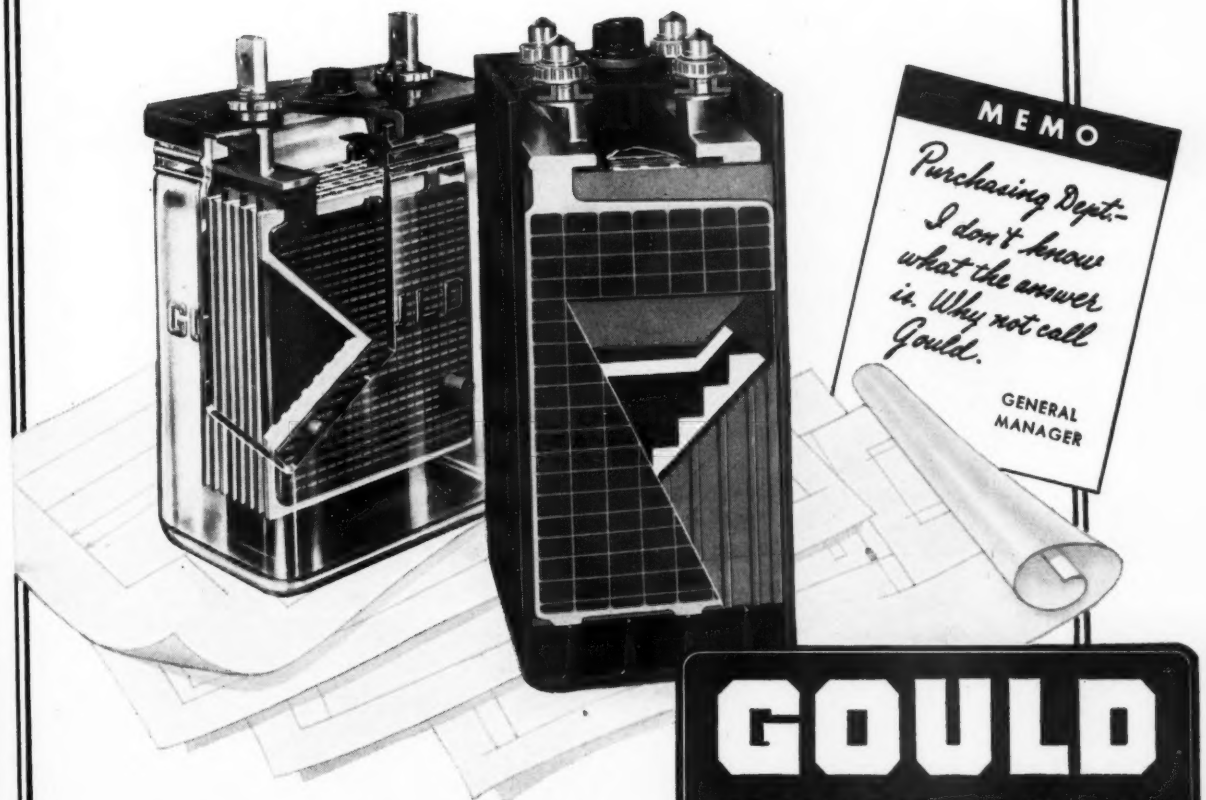

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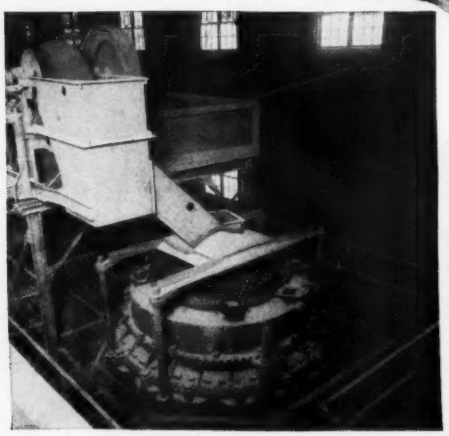

↑ Link-Belt belt conveyor feeding ore to a Symons shorthead cone crusher.

→ Link-Belt belt conveyors serving one of the screening operations at the Climax Molybdenum Co. Mine.

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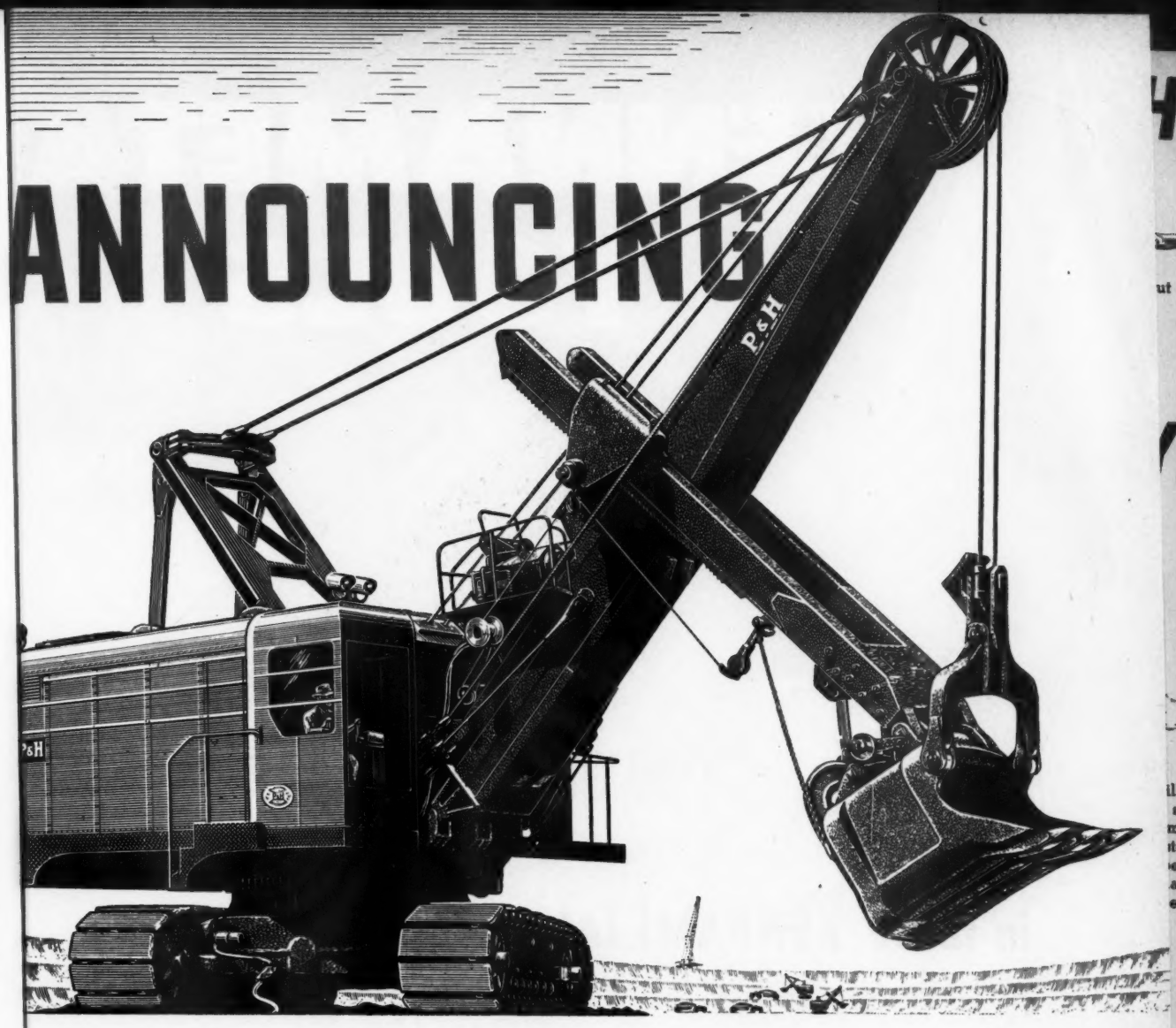

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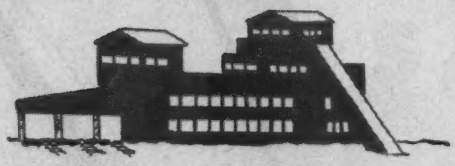
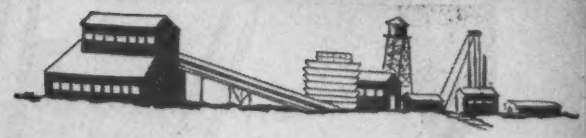


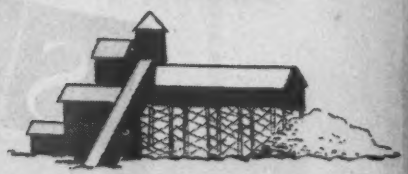
4 places cut with steel, 131 with Kennametal; Peerless seam. Drilling time cut from 1½ hours to 5 minutes; Miller creek No. 1. Bit cost .4 of 1 cent per ton of coal mined; Pittsburgh seam.

POTASH



Virtually all potash mined in the United States is cut and drilled with Kennametal.

CAUSTIC CLAYS and FLINT



A Kennametal HD-1¾" bit has drilled 8,000 feet of this formation and still good for more footage. Where two men drilled and one sharpened while steel was used, the sharpener has now been eliminated and two men are adequate. Power consumption cut. Drilling speed increased.

. . . for Mining COAL, CLAY, SALT, POTASH, GYPSUM, other non-metallic minerals, and . . . IRON ORE

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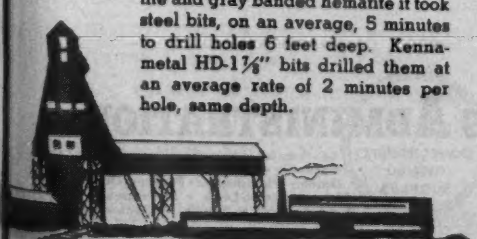
Tests show that it took steel bits from 90 to 110 minutes to drill holes in gypsum formations, 9 holes 7 feet deep. Kennametal did the same job in 55 minutes. This test was made in gypsum formations that prevail in New York, Michigan, and Ohio. On an average Kennametal bits drill between 2 and 4 miles.

IRON ORE

Drilling dry formations of red hematite and gray banded hematite it took steel bits, on an average, 5 minutes to drill holes 6 feet deep. Kennametal HD-1⅞" bits drilled them at an average rate of 2 minutes per hole, same depth.



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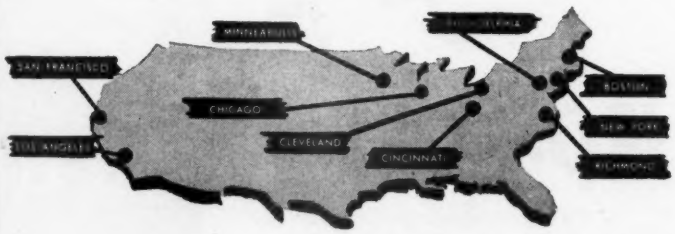

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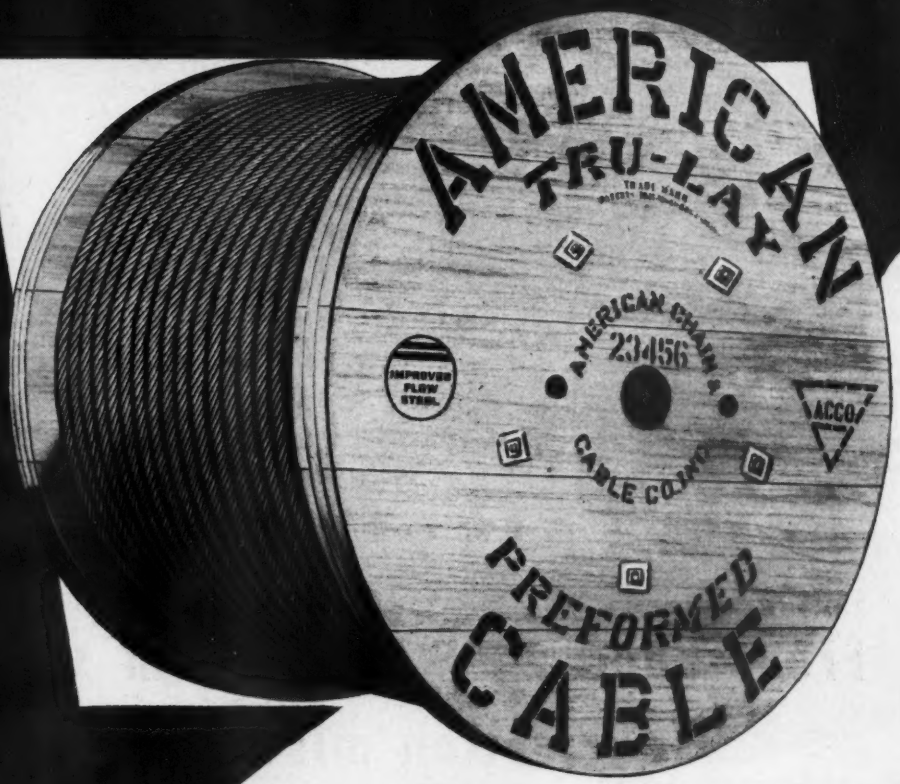

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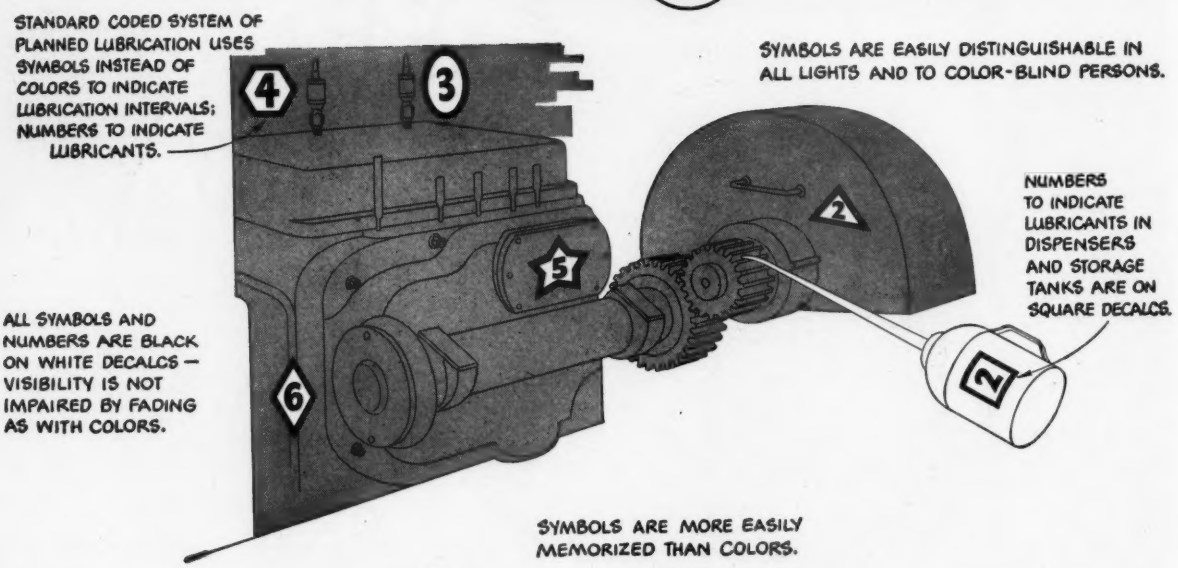
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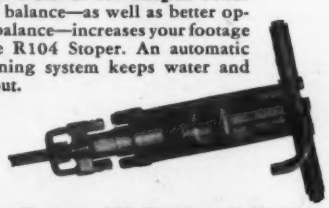
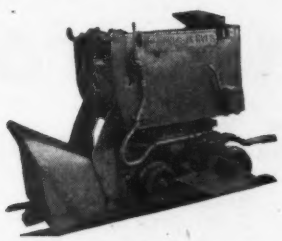
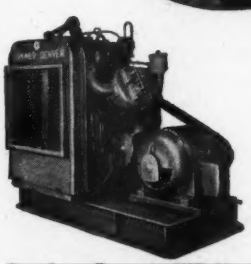
Gardner-Denver 104 Stoper better physical balance—as well as better operating balance—increases your footage with the R104 Stoper. An automatic self-cleaning system keeps water and sludge out.



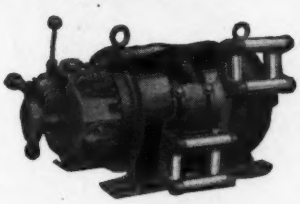
Gardner-Denver S55 Sinking Drill This popular Gardner-Denver Sinking Drill is known among users as the most efficient 55-pound drill on the market. It has perfect balance—the embodiment of the greatest drilling capacity at which qualities of easy riding and conservative air consumption are maintained.



Gardner-Denver GD14 Loader with its wide clean-up range, extra power and speed, the Gardner-Denver GD14 uses the famous Gardner-Denver fulcrum principle to bite into your muck piles and discharge the dipper quickly.



Gardner-Denver WB Vertical Water-Cooled Compressor remarkably compact in design, the Gardner-Denver WB Vertical, 2-Stage Water-Cooled Air Compressors have efficiencies comparable to those of larger horizontal compressors. The combination radiator and intercooler is an advantage where cooling water is scarce or expensive.



Gardner-Denver Airslusher a powerful, 5-cylinder high torque, radial air motor gives the Gardner-Denver Airslusher maximum power and speed in either direction. In contrast to older types, it has a single throttle lever which operates at a touch—no pulling or tugging.

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For complete information, write Gardner-Denver Company, Quincy, Illinois.

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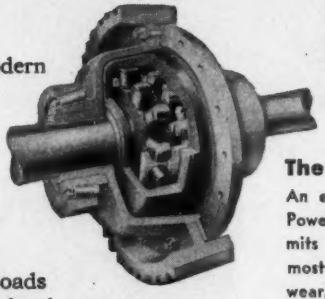

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Editorials

JULIAN W. FEISS, *Editor*

January, 1947

PRETIUM LABORUM NON VILE

THIS high sounding Latin phrase, which was discovered inadvertently in the dictionary, is the motto of the Order of the Golden Fleece, a decoration of knighthood formerly conferred by the emperors of Austria. Translated it reads, "The value of work is not trifling."

In searching for the underlying causes of unrest in the mining industry it is obviously necessary to go deeper than an analysis of wage scales, union leadership, living conditions, or health and welfare funds. Dorothy Thompson recently came very close to what may be a fundamental difficulty when, in reference to the coal strike, she pointed out the disparity between price and value. Which is the more valuable, an ounce of glamour perfume or a ton of coal? We need not inquire which will bring the higher price on the market. A similar question might be asked concerning the relative value of the coal miner and the radio crooner.

This disparity, obviously not based upon intrinsic worth, cannot be claimed to cause coal strikes or labor unrest. However, when the coal mines close down the difference becomes quite apparent to the public. Without disparaging artistic endeavor, we doubt if a crooners' strike would result in a national catastrophe.

We suspect that what the mining industry needs is recognition of its worth; does not the foundation of industrial civilization rest upon its daily efforts? Unfortunately the only public recognition mining receives is when a strike dominates the headlines.

Labor leadership has been quick in exploiting this unfavorable feature for its own ends. Irrespective of one's opinion of John L. Lewis, he is a master psychologist who has never underrated the value of publicity either for himself or his union. Good or bad, it makes no difference to Lewis as long as he and his miners are before the people constantly. Lewis knows that one juicy divorce case attracts more public attention than a thousand golden weddings.

It was by the exploitation of such psychology that the Communists came into power in Russia and by similar tactics they are attempting to undermine society in this country. They have already infiltrated into our labor unions where the seeds of discord are being planted. Although such agitation is difficult to combat, especially when the agitators are unscrupulous and well organized, it appears as though mining could stand some favorable publicity similar to that expended on movies, radio, sports and other entertainment industries. The public has taken the necessities of life too much for granted; maybe we should start tooting our own whistle.

FIGURES DON'T LIE BUT——

ROBERT R. NATHAN ASSOCIATES prepared an economic report early in December for the Congress of Industrial Organizations. Mr. Nathan was former deputy director of the Office of War Mobilization and Reconversion and during the last decade has been considered one of our most brilliant economists. The gist of his conclusions was that corporate enterprise in this country during 1946 could support a 25 per cent wage increase without raising prices and without reducing earnings (after taxes) below the 1936-39 level.

The late Arthur Brisbane maintained to his deathbed that nobody really understands economics. Mr. Brisbane was certainly no student of economic theory but the Nathan report seems to support his contention. Fortunately one of our ablest economists has weighed the Nathan report in the balance of reason and found it wanting.

Dr. Sumner H. Slichter, of Harvard, has presented a masterly analysis of this report in the *New York Herald Tribune* for December 19 and 20. Dr. Slichter not only exposes the fallacious reasoning behind Mr. Nathan's theory that wages can be increased without a price rise, but more important, he defines the function of profits. Mr. Nathan, like many who have succumbed to New Deal philosophy, seems to attribute an element of evil to the making of profits.

Dr. Slichter says that Mr. Nathan fails to understand the role of profits in modern economy. He further states "Profits are the reward for two peculiarly useful activities. They are the return which business owners receive on equity capital and they are the yardstick by which managers demonstrate their efficiency to their employers by developing new methods and new products." Without the profit incentive all industry would die.

For Mr. Nathan's benefit we can prove algebraically that 2 equals 1. (See page 44.) Our mathematics may contain the fallacy of dividing by zero but the procedure is correct. In evaluating Mr. Nathan's report, we suggest that it be divided, or better yet, multiplied by zero.

Two-Way Shaft Communications

★

By
C. N. KRAVIG
Assistant Mine Superintendent
and
REX TARIO
Electrical Engineer
Homestake Mining Company

★

Electronic communications are in their infancy in the mining industry. Technical difficulties have prevented the use of radio underground in the past but wartime developments have increased the effectiveness of short wave communications and improved the portability of transmission and receiving equipment. Homestake has pioneered in shaft electronic communications. Their methods have stood the test of time and hard use. The experiment is no longer on trial—results have been justified by operating experience.

AT Homestake, signaling systems have evolved from the simplest mechanical devices through more involved electrical annunciator methods to a two-way oral communication system in which a cage tender can speak to the engineer and receive a reply with the cage either moving or stationary. An attempt will be made here to describe briefly the evolution leading up to carrier-current signaling and the results attained through its use.

Until about 1916 shaft signaling was done by mechanically operated bells, operated by cage-tenders through small cables or jointed steel rods counter-balanced by weights or springs. This method served quite well for shallow shafts, but as depths exceeded 1,000 ft. it became too slow and heavy to operate satisfactorily. The first electrical signal system was installed in 1916. It consisted simply of a pair of conductors installed in steel conduit in each hoisting compartment with a pull switch at each station to operate 110-volt, alternating current, single-stroke bell near the engineer's position. A small steel cable was suspended from the operating plunger of each pull switch to the top of the next lower switch forming a continuous signal line in the shaft compartment. This system was an improvement over the mechanical system it replaced in speed of operation and lower maintenance cost but had the same serious disadvantage of the engineer not being able to determine where the signal originated.

The annunciator system was developed and installed in one of the shafts in 1921. One conductor was connected from each pull switch to its associated relay coil in the annunciator box near the engineer's position. Operating a pull switch completed a ground return circuit energizing the signal bell and the relay coil which released an opaque door revealing the station number from which the signal originated. This system reached the peak of its development in the Ross Shaft which began operating in 1934.

C. N. Kravig and Rex Tario at the Yates shaft

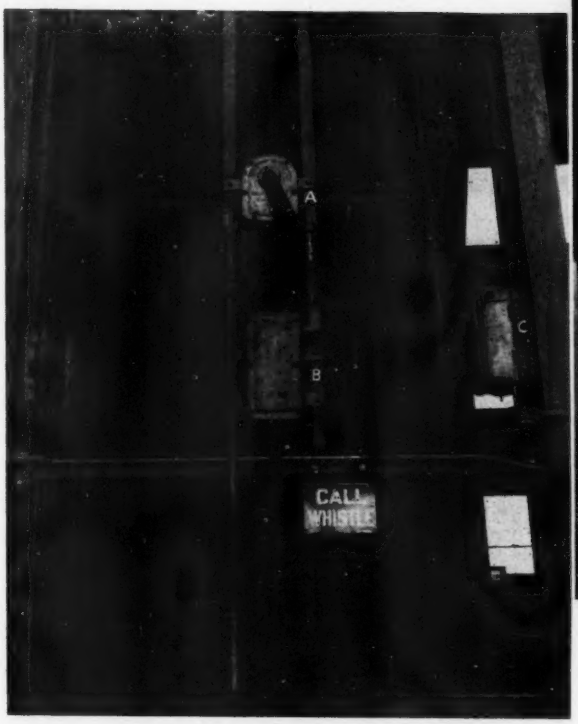
The Ross Shaft Signaling System Incorporated Numerous Improvements

The principle used was the same as in earlier annunciator systems but a number of improvements were incorporated. A double winding relay was used for each station. When a pull switch is operated a circuit is closed from ground through a wire, through the series winding of a relay, then through the signal bell coil and through the 110-volt secondary winding of the supply transformer to ground. The series coil closes two relay contacts, one of which completes the holding coil circuit and the other completes a circuit to a six-volt light indicating the origin of the signal. The indicating lights are installed on the station numbers on the skip or cage-position indicator so that the engineer can see the position of the cage or skip and the origin of the signal without moving his eyes. The lights are extinguished by a switch on the throttle lever and a relay which opens the holding coil circuit.

A new type pull switch was also developed for this shaft. The cast-iron box was made smaller but stronger with but two bolts holding the cover. The switch mechanism plunger supports a short manila rope supported by a relatively weak spring. The long station to station signal rope is supported by an auxiliary, strong spring, side mechanism. All station to station signaling is done with the short rope saving the long rope for occasional interstation and shaft inspection work.

For easier maintenance and safer operation the man cage compartment and each ore skip compartment has a complete individual signal system: From pull switch, through secondary steel conduit and submarine type main cable, to relay cabinet and annunciator and power source. There is no

Right: The man-hoist cage
A. Battery boy
B. Chair transmitter
C. Voice receiver and transmitter
D. Microphone



Left: The surface level at the Yates shaft
A. Electric call horn
B. Call horn switch
C. Man cage limit switch

possibility that faulty switches or wiring in one compartment can cause false signals from another compartment.

The Homestake worked for many years to develop a radio signaling system. No practical results were attained until some 10 years ago when efforts were directed toward carrier current signaling. In this system the hoisting rope is used to carry the fundamental frequency, which can be modulated for voice transmission or used for code signaling. The first sets built were for code signaling, then other features were added, such as slack rope signals and chair position indicators. Code signaling was abandoned rather abruptly when it was found that lightning could introduce signals. The slack rope alarm feature was not successful because under certain conditions a "floating" rope end, when the cage was on chairs, could produce a false but intelligible signal. The next step was a one-way voice system and it was but a short step further to two-way voice signaling when it was found that much time and trouble could be saved by the engineer being able to speak to the cage tender and discuss hoisting operations. The chair position indicators were retained.

Two-Way Voice Communications Feature Present System

The equipment in use at the present time in all operating shafts consists of two-way voice communication between engineers and cage tenders, with chair position indicators for all cages equipped with chairs. No effort will be made in this paper to depict in detail the circuits and equipment as these have been thoroughly described in technical publications. It must be remembered, however, that improvements are constantly being worked out such as decreasing noise levels and developing more sturdy equipment where necessary. Maintenance and repair work consumes about 60 man-hours a year for all of the equipment for one compartment of a shaft. This compares about equally with the maintenance of wire and annunciator systems.

The carrier frequencies used have been standardized as follows:

160 kilocycles for voice on all ore hoists equipped with cages
130 kilocycles for voice on man hoist cages
170 kilocycles for chair indicators on man hoist cages
190 kilocycles for voice and 150 kilocycles for chairs for the second man hoist cage at the Yates Shaft
140 kilocycles will be used for voice for the run-about cage at the Yates Shaft when it is put into operation.

There has been absolutely no trouble with cross-talk between compartments in any one shaft with a 10-kilocycle difference in carrier frequencies nor any between any of the three shafts even though identical frequencies are used in each. There has been no noticeable weakening of signal strength with shaft depth; two shafts are operating to a depth of 4,100 ft. and the other to 3,200 ft. Due to the standardization of frequencies and mountings it is possible to replace a faulty cage unit and tune the replacement in less than a half hour.

The first cost of carrier current signaling is much less than that of conventional wire systems and is not dependent upon the depth of the shaft. All of the carrier current equipment in the Yates Shaft cost about 17 per cent as much as the annunciator system in the Ross Shaft. A modified annunciator system was installed in the Yates Shaft as an auxiliary to the carrier current system in which there

Left: Voice receiver and transmitter with cover removed
A. Loud speakr
B. Receptacle for extension microphone
C. Microphone
D. Chair operating lever

Below: Battery box and chair transmitter with cover removed

is a relay and light for each 1,000-ft. section of the shaft instead of one for each station. The annunciator systems in both shafts are extendible to the 5,000-ft. level. This modified system cost 54 per cent as much as the complete system in the Ross Shaft. The cost of the modified annunciator system plus that of the carrier current system in the Yates Shaft was 71 per cent of the cost of the complete annunciator system alone in the Ross Shaft.

Operating Experience Has Justified the Installation

Any operating innovation connected with mining must stand the test of routine operations over a period of time before it can be declared a success, as the rough usage coupled with humid or wet conditions often renders impractical any innovation of a delicate nature.

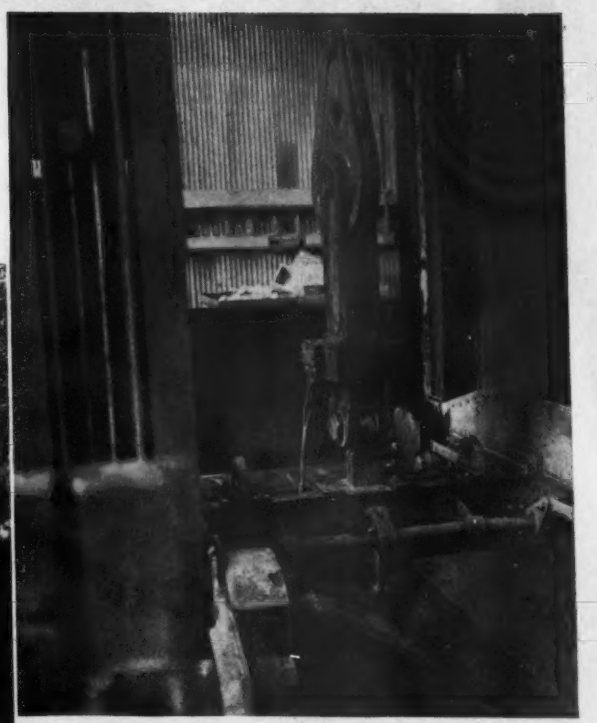
The Homestake carrier current signaling system, consisting of a chair indicator and an oral communication system, whereby two-way communications by voice can be carried out from a stationary or moving cage, has proved very satisfactory over a period of more than six years. It is the standard means of shaft signaling at all three operating shafts. The older annunciator bell signal system is maintained, however, so two independent signal systems are available at all times though the bell signal is used only in case of rare failures of the carrier current system.

Very few outages have developed during routine operations and these have been only of short duration; such failures have been less frequent than the failures on the bell signal system where, in addition to electrical outages, there were breaks in the shaft bell rope.

The advantages of the carrier current signal system which includes the chair indicator, are those of greater safety as well as greater operating efficiency; it is safer, faster, more flexible and more comprehensive because more specific and detailed instructions are possible with oral communications. Cagers and hoisting engineers are highly in favor of the oral communication system.

Each of the Homestake shafts service over 20 levels necessitating the frequent caging of timber trucks, pipe trucks, trackmen's trucks, cars and locomotives to be repaired or transferred, and considerable development waste which must be hoisted to a level where it can be dumped for stope filling; this work requires the use of cage chairs a great number of times each day. The oral instructions from the cager to the engineer, together with the red signal light of the chair indicator when the chairs are in the engaging position constitute the greatest safety features and time savers of the carrier current signaling system over the bell annunciator system. The routine answering of cage calls, however, is also facilitated. In placing a cage on chairs for loading or unloading heavy material such as cars or haulage locomotives the cager instructs the hoisting engineer by the oral instruction "On Chairs"; this instruction is given when the cage is 5 to 10 ft. short of its designated level and on a descending trip the engineer slows the cage sufficiently so that when the cager manually operates the cage chairs at a point two or three feet from the station plate, he can lower the cage gently on the chairs. The red light chair indicator on the engineer's platform flashes on when the cager manually operates the chairs; thus a double signal tells the engineer exactly where the cage is and what is being done. In an ascending trip the cager also signals, "On Chairs" 5 to 10 ft. before the designated stop is reached but in this case the hoisting engineer does not stop flush with the station plate but continues to a point a foot or two above

Right: Voice and chair transmitter coupling coil



Below: Chair transmitter switch under the deck of the main hoist cage

the level so the cager can operate the chairs. As soon as the chairs are operated the red light chair indicator flashes on and the engineer lowers the cage gently to the chairs without further signal. When the cager wishes to continue movement from a position on the chairs he releases the chair lever and signals, "Off Chairs" (on a descending trip), and orally gives the next designated level signal; the engineer then hoists the cage until the red light chair indicator turns off and the green light flashes on indicating that the chairs have sprung back out of catching position, and then proceeds to lower the cage to the next signaled level. On an ascending trip from a position "On Chairs" the cager merely trips the chair lever and signals the next level; as the engineer starts hoisting the red light turns off and the green light indicates a release of the chairs. This double signaling with red and green chair indicator lights plus the oral instructions have speeded up and added safety to the work of caging with the use of chairs and have prevented to a great extent the kinking of the hoisting rope. Before the use of carrier current oral signals and the chair indicator a hoisting engineer might forget that the cage was on chairs and slack off a great deal of hoisting rope without being aware of the fact because of the weight of the rope in the deep shafts.

Formerly, with only bell signals, the engineer did not know whether the cage would be placed on chairs or not at any designated level, thus making it necessary for him to lower the cage very slowly on approaching any designated stop, in case the chairs were to be used. In hoisting the cage to a higher level a stop often was made flush with the station plate and before the chairs could be used a bell signal to raise the cage and another signal to lower the cage onto the chairs required considerable time. Lowering the cage from a position on the chairs necessitated a bell signal to hoist the cage up a few inches to release the chairs and another signal for the next level.

Communication Possible with Cage in Motion

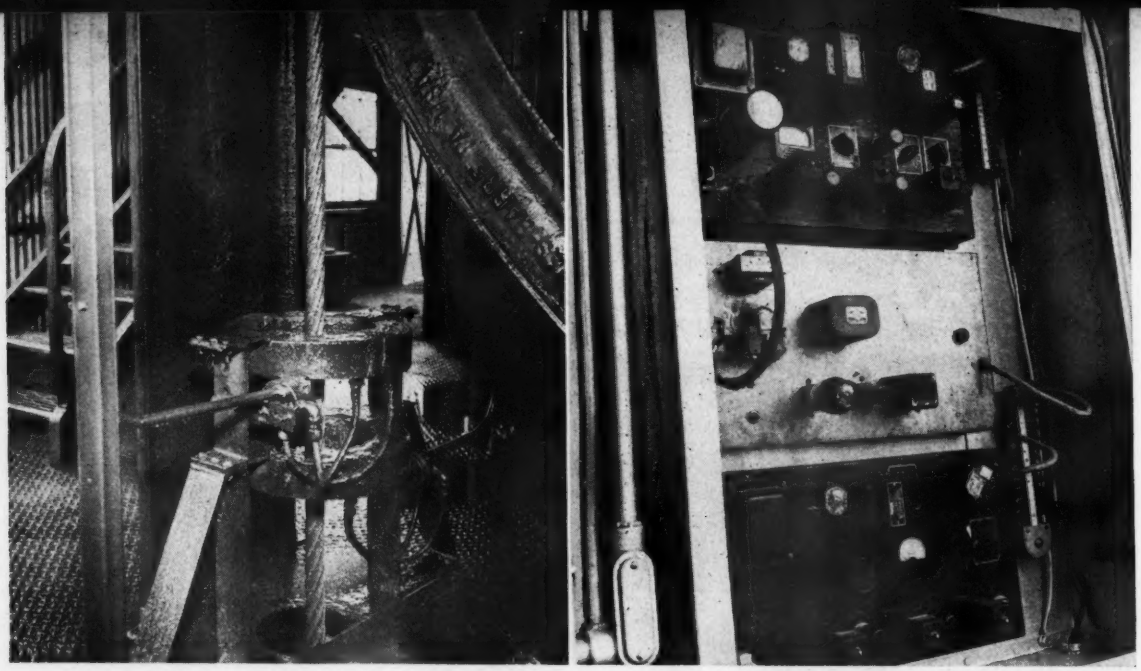
The cager can communicate with the hoisting engineer orally while the cage is in motion, thus speeding up the work and often saving a trip. The cager frequently starts on a long trip when a call signal comes in from an intermediate level; with the carrier current signaling system he can resignal the engineer while in motion, and the intermediate stop is made, thus the time required in waiting for cages is kept to a minimum. The actual signaling is much faster orally than by bells, thus, for the 3,800 level a signal 7—4 (seven—four) is given orally whereas by bells it is necessary to pull the bell cord seven times, pause and pull it four times.

A routine safety feature of the carrier current system is that of the cager informing the hoisting engineer of any heavy loads, or of special loads such as dynamite, blasting caps, or long material lashed to the hoisting rope such as pipe or rails, so that the engineer runs on reduced speed. Formerly the bell signals were executed slowly to indicate slow speed.

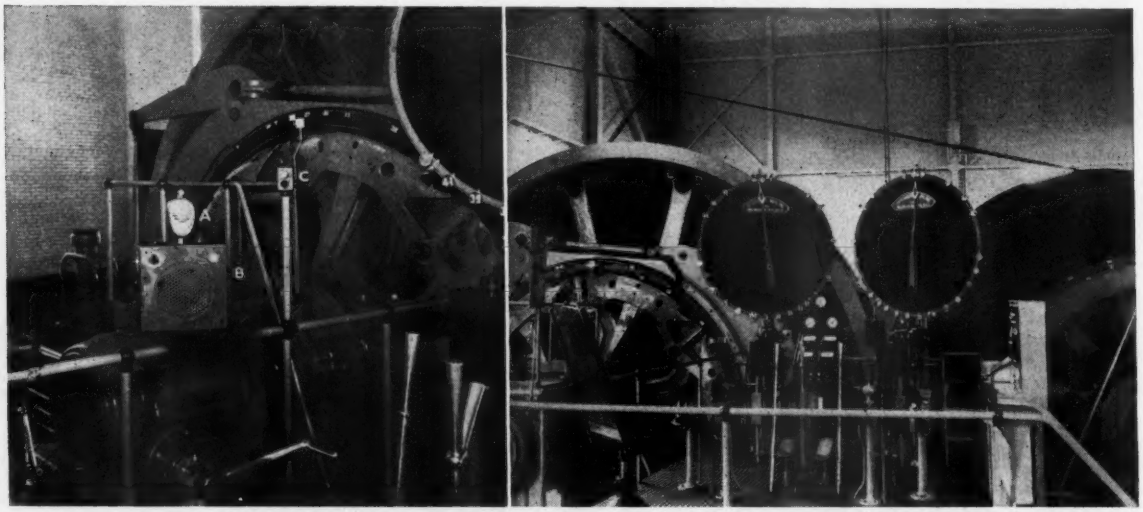
During shaft inspections, shaft repair work, or retimbering of shafts the oral two-way communication facilitates the work and there is little danger of a cage becoming stranded between levels as formerly happened on occasions, when the bell rope broke.

The hoisting engineer can communicate with the cager at any time without delay and this has proved useful in locating foremen or shift bosses in case of accident or other urgent business.

The carrier current system has certain shortcomings, however; it cannot be used by a cager who is not riding on the cage as is the case when hoisting long material such as pipe or rails. When moving the cage for loading or unloading long material the cager uses



Left: Voice and chair transmitter coupling coils located below the sheave wheels. At right the "Radio Room" at the main hoist sheave wheels, showing from top to bottom the voice receiver, the voice transmitter, and the chair receiver



Left: The main hoist engineer's platform showing: (A) microphone, (B) receiver, (C) chair lights. Right: Ore hoist engineer's platform for the Yates shaft

the bell signal system and the pull switch on the station.

The carrier current signaling system has not been installed for hoisting ore as the only signal used to any extent is that of "Three Bells" from the loading pocket. For major repair work or retimbering in the skip compartment a temporary carrier current device is installed on the skips.

In conclusion it can be said that the carrier current signaling system at Homestake has proved to be more practical, safer, faster, more flexible and more comprehensive than the annunciator bell signal system even though the bell signal has given satisfactory service through a number of years.

Mr. Harold E. Ross and Mr. Nelson E. Anderson, electrical engineers employed in the Homestake electrical department, deserve great credit for the successful operation of the carrier current signaling system. They developed and built all of the equipment under the able direction of Mr. John F. Wiggert, chief electrical engineer, retired; Mr. Cedric L. Gust, now chief electrical engineer; and Mr. Ed. G. Ross, mine superintendent.

Grateful acknowledgment is given to the authors of various technical publications from which much of the data used in this paper were taken.

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Coal Mine Power Costs

Mechanization Has Increased the Use of Power Underground, But the Power Cost Has Not Increased Proportionately Due to Improvements in Line Material and Operating Practices

By G. B. SOUTHWARD

Mechanization Engineer
American Mining Congress

THE modernization of underground electric power systems has necessarily kept pace with the growth of coal mine mechanization, although the power development has not been as spectacular, nor has it attracted as much attention as the development of mechanical loading. Certainly it is now recognized to be of major importance as, obviously, machines must have adequate power for efficient operation, but in the beginnings of mechanization, this fact was not clearly recognized and the mine power system was usually given only casual consideration—if it were considered at all. This is altogether understandable; most mines were already using some electricity for cutting and haulage so it was the natural sequence simply to nip the loading machine cable on to the trolley wire without giving much thought to what was between that point and the power house.

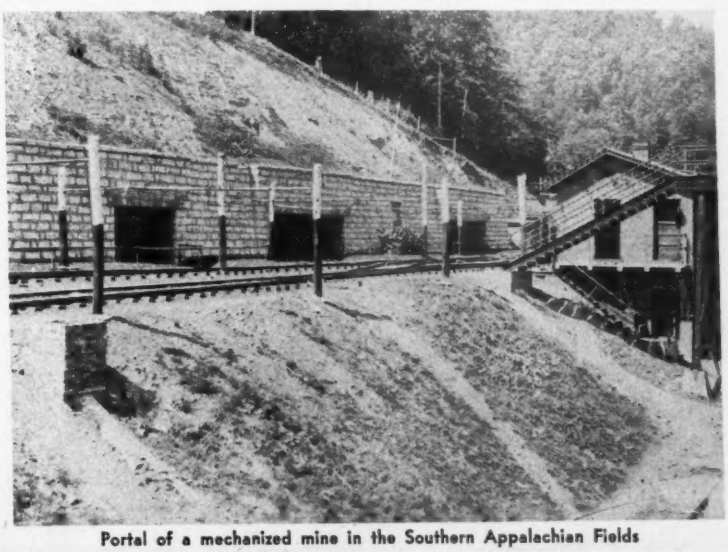
After loading machines and conveyors had progressed from the experimental into the practical operating class, it soon became evident that the power system was an extremely important factor in the tonnage produced by the machines. This immediately gave rise to some new ideas in power installations such as heavy feeder lines, direct continuous returns, and keeping the substation within a close distance of the live workings. All this was regarded by many as a necessary evil and it was supposed that the power cost for complete machine operation underground would be raised proportionately as mechanical tonnage increased. However, later developments did not support this thought. Technological improvements in line material and installation methods, together with the elimination of power losses through better maintenance practices and higher operating efficiency of machines, all have combined to keep the power cost of a completely mechanized mine down to a reasonable figure.

Mine Power Surveys

The power trend over the past years has been shown in a series of annual surveys, made by the West Virginia Engineering Company, Charleston, W. Va., covering the use of electricity in a large group of bituminous coal mines in the southern Appalachian field. The survey is quite comprehensive; in 1945 it covered 173 mines which produced a total of approximately 50,000,000 tons of coal during the year, and presented rather detailed data on each of these mines, giving results on various phases of production and power. The operations are typical of their field, both as to mining methods and the use of power, so the data can be considered as representative of this field and taken as a basis for drawing certain conclusions as to the electric power trends.

Copies of the data have been furnished to the members of our Coal Division through the courtesy of Mr. H. P. Musser, and in presenting an analysis of the 1945 survey, he submits the following statement:

"A pronounced trend for the year 1945 is that all the classes of mines are using greater substation capacity to produce total output. This is undoubtedly the influence of greater mechanization which has been in progress in the last few years and the substitution of electrical power for man power. The larger amount of horsepower connected to the a.c. power lines of the mines has tended to increase power demand in total quantity and in relation to output.



Portal of a mechanized mine in the Southern Appalachian Fields

Also the increase in power use per ton and total cost of power per ton continues upward following the trend established a few years ago, but is now more pronounced for the larger companies. This increase is due to longer distances for ventilation and haulage.

"The smaller mines are still adding more d.c. horsepower inside the mines but the larger ones have not done likewise during the year.

"Fewer tons per connected horsepower are being produced by practically all the mines, suggesting that equipment is being added faster than output is increased.

"The cost of power per kwh is increasing despite larger use due to the influence of coal clause penalties and poor load factor caused by added equipment and increased demand. However, new power rate schedules are now in effect and should be felt more effectively in the future.

"There are signs that the increased power costs due to mechanization are levelling off and that in the future efforts will be made to increase tonnage without further increases in equipment. The new equipment has been lightly used but probably will be loaded more fully in the future, thus bettering the load factor and the cost of power per unit but such improvements will be affected by increased mining distances."

An over-all summary of the data compiled in the last 10 annual surveys—1936-1945, inclusive—is given in Table 1 which has selected a few of the items on power use that are believed to be of interest to the average coal operator and engineer (not electrical experts). This table deals entirely with average figures which have been calculated for each of the items in each of these years and while "averages" have their limitations in practical use, they do serve in this case to bring out certain interesting facts.

As Mr. Musser pointed out in his analysis, the cost per kwh has increased during recent years, but going beyond his statement and looking back to the 1936 figures, we find that there has actually been a decrease in cost per kwh in each of the tonnage classification groups since that date. For example, in the 10,000 to 20,000 monthly tonnage class, the cost per kwh of 1.81 cents in 1936 was lowered to 1.68 cents in 1945 and somewhat similar reductions apply over the years in the other tonnage groups. This evidently indicates a greater efficiency in the use of power all along the line as machines replace hand work. Growing mechanization is accompanied by a continually increased kwh used per ton of coal mined (Column 5) in all of the tonnage groups and this is further reflected in a higher power cost per ton shown in Column 6 for 1945 as compared to 1936. However, this power cost increase during the past 10 years is only a small percentage of the total raise in coal production cost that has occurred over that same period.

Table I

POWER COSTS OF COAL MINES—AVERAGES FOR TEN YEARS, 1936 TO 1945

	(1) Average Monthly Tonnage	(2) Substation Capacity K.W.	(3) Average Monthly K.W.H. Purchased	(4) Total Cost Per K.W.H. Cents	(5) K.W.H. Per Ton Coal	(6) Power Cost Per Ton Coal Cents
Monthly Tonnage Class—10,000 to 20,000 Tons						
(40 Mines in 1936, 43 in 1945)						
1936	14,314	298.75	74,674	1.81	5.217	9.44
1937	14,474	310.72	78,446	1.74	5.420	9.43
1938	14,695	393.87	92,659	1.71	6.305	10.75
1939	13,760	347.92	80,880	1.68	5.88	9.87
1940	14,433	325.00	79,136	1.71	5.48	9.37
1941	14,955	309.18	79,331	1.56	5.30	8.30
1942	15,374	326.79	94,307	1.54	6.13	9.42
1943	15,067	333.70	88,799	1.57	5.89	9.23
1944	14,432	345.35	89,743	1.58	6.22	9.83
1945	14,443	369.51	85,923	1.68	5.97	9.49
Monthly Tonnage Class—20,000 to 30,000 Tons						
(34 Mines in 1936, 36 in 1945)						
1936	24,706	443.38	128,514	1.63	5.202	8.48
1937	24,954	463.89	135,164	1.55	5.417	8.40
1938	23,870	527.73	139,917	1.58	5.861	9.25
1939	24,565	479.64	134,134	1.46	5.460	7.99
1940	24,946	475.16	140,145	1.46	5.618	8.19
1941	24,945	494.23	144,863	1.41	5.81	8.19
1942	23,915	448.48	132,718	1.48	5.55	8.22
1943	24,465	461.29	144,159	1.43	5.89	8.43
1944	24,578	466.67	146,831	1.46	5.97	8.64
1945	24,585	516.67	153,055	1.51	6.31	9.14
Monthly Tonnage Class—30,000 to 60,000 Tons						
(26 Mines in 1936, 26 in 1945)						
1936	39,339	607.69	168,634	1.54	4.617	7.09
1937	39,607	660.94	196,477	1.46	4.961	7.22
1938	36,857	715.62	200,695	1.45	5.445	7.91
1939	40,231	769.20	210,402	1.41	5.230	7.39
1940	42,340	731.81	234,603	1.37	5.540	7.60
1941	42,130	736.11	232,853	1.34	5.53	7.38
1942	41,151	717.76	233,560	1.35	5.68	7.65
1943	38,373	685.34	226,363	1.40	5.90	8.23
1944	38,035	643.18	217,218	1.39	5.71	7.94
1945	38,774	796.15	255,587	1.42	6.57	9.34
Monthly Tonnage Class—Over 60,000 Tons						
(5 Mines in 1936, 15 in 1945)						
1936	75,801	1,120.00	306,966	1.44	4.050	5.82
1937	90,546	1,277.00	489,048	1.20	5.401	6.47
1938	88,282	1,382.00	594,076	1.15	6.729	7.73
1939	86,825	1,070.00	541,730	1.10	6.240	6.87
1940	90,090	1,416.67	512,358	1.17	5.690	6.63
1941	86,017	1,411.82	592,332	1.11	6.89	7.65
1942	74,649	1,170.91	459,215	1.19	6.15	7.30
1943	80,440	1,250.00	485,859	1.21	6.04	7.30
1944	84,557	1,420.00	515,405	1.21	6.10	7.37
1945	80,935	1,592.86	543,479	1.22	6.87	8.25

Power Used for Mechanical and Hand Loading

In order to see in more detail what effect the increase of mechanized loading has had on the amount of power used underground, this article will depart from the breakdown into tonnage classification groups used by the West Virginia Engineering Company and will separate the 1945 figures into groups classified by various types of loading. To start the new classification, we will note that the 1945 survey covers a total of 173 mines producing nearly 50,000,000 tons per year, or slightly over 4,000,000 tons per month. From these, we will omit from further consideration in this discussion the smaller mines which produced less than 10,000 tons per month. This will eliminate more

than one-quarter of the total and leave a remainder of 120 mines, each producing more than 10,000 tons per month and altogether having a total annual output of 44,000,000 tons or 3,467,000 tons per month. This was mined by the following loading methods:

	Tons per month
Mechanical loading	1,256,000
Conveyor loading	610,000
Hand loading	1,781,000

The above tonnages expressed by percentages show that mechanical loading and conveyors produced 51 per cent of the total output, while hand loading produced 49 per cent. This proportion is closely parallel to the 1945 U. S. total bituminous production, when 56 per cent of the underground tonnage was loaded mechanically and 44 per cent loaded by hand; which fact supports a previous statement in this article that these mines may be considered as being fairly typical of the industry.

To continue the breakdown, in order to examine further facts and trends in power use, we divide the 120 mines into four classes, each based on a predominant method of loading. The percentage of mechanization in these mines again follows the general trend for the country—that is to say, some are completely mechanized, some produce a majority of their tonnage with machines but retain a small amount of hand loading, others are still on an all-hand-loading basis, while a number have just started their mechanized program with only a few machines in operation. Subdividing the group of 120 mines producing more than 10,000 per month into the foregoing classifications gives us the final breakdown as compiled in Tables 2, 3, 4 and 5, as follows:

Mobile Mechanical Loading — 23 mines from 75 to 100 per cent mechanized produced a total of 522,790 tons per month. (See Table 2.)

Conveyor Loading—11 mines from 67 per cent to 100 per cent mechanized produced a total of 239,975 tons per month. (See Table 3.)

Mechanical and Conveyor Loading —11 mines from 85 per cent to 100 per cent mechanized produced a total of 463,649 tons per month. (See Table 4.)

Hand Loading—25 mines using all-hand-loading produced a total of 538,046 tons per month. (See Table 5.)

Other mines, 50 in number, have made initial mechanical installations but are still predominantly hand loaded and produced 1,702,540 tons per month. This group being in a transition period is not discussed further in this article.

Our principal interest in examining the power figures in these tables centers primarily on the cost of power per ton of coal, but it is difficult to make comparisons on this basis because of varying power rates existing in different fields. The cost figures in Tables 2 to 5 show that there is quite a wide range in each classification; for example, Mine No. 40 (Table 4) has a low cost of 0.91c per kwh., while Mine No. 52 (Table 5) with hand loading has a high of 2.36c per kwh. It is impossible, with the data at hand, for this article to show reasons for such variations and since the cost per kwh. is directly reflected in the power cost per ton of coal, neither can we make further analyses of that item. We must, therefore, accept the figures as given and go on from there to see what, if any, facts are developed in column 4 of Tables 2 to 5, showing the kwh. used per ton of coal mined.

Table 2

1945 DATA ON MINES WITH MECHANICAL LOADING

Mine	(1) Seam Height Inches	(2) Average Monthly Tonnage	(3) Cost Per K.W.H.	(4) K.W.H. Per ton Coal	(5) Power Cost Per Ton Coal
1	60	11,271	1.74c	4.82	8.40c
2	48	11,491	1.89	3.62	6.85
3	30	11,930	1.78	6.79	12.09
4	40	12,185	2.09	4.61	9.63
5	45	12,521	1.62	7.64	12.38
6	38	13,483	1.59	4.76	7.58
7	38	13,733	1.72	5.42	9.84
8	52	15,639	1.79	4.91	8.79
9	42	17,182	1.62	5.81	9.41
10	54	17,527	1.49	7.49	11.12
11	56	20,017	1.74	4.41	7.69
12	48	21,204	1.67	6.79	11.32
13	69	26,761	1.61	2.93	4.70
14	55	30,259	1.68	5.87	9.58
15	42	32,648	1.48	5.56	8.25
16	60	97,168	1.39	4.91	6.84
17	54	16,211	1.98	4.18	8.28
18	48	17,814	1.63	4.71	7.66
19	48	19,476	1.60	9.43	15.04
20	54	21,047	1.68	4.22	7.09
21	40	24,693	1.59	7.64	12.11
22	33	25,759	1.47	5.38	7.90
23	44	32,771	1.35	5.54	7.48
		Total 522,790 Tons per Mo.		5.50 Aver. K.W.H.	

Table 3

1945 DATA ON MINES WITH CONVEYOR LOADING

Mine	(1) Seam Height Inches	(2) Average Monthly Tonnage	(3) Cost Per K.W.H.	(4) K.W.H. Per Ton Coal	(5) Power Cost Per Ton Coal
24	40	11,897	1.59c	5.61	8.94c
25	36	14,571	1.72	6.23	10.73
26	40	15,105	1.63	3.86	6.28
27	40	15,322	1.82	7.26	13.18
28	38	28,826	1.38	10.15	14.05
29	37	15,839	1.62	6.77	10.95
30	42	20,252	1.46	6.21	9.08
31	39	22,001	1.54	7.54	11.61
32	37	23,400	1.57	5.30	8.30
33	56	38,836	1.38	8.38	11.57
34	42	33,296	1.56	7.98	12.42
		Total 239,975 Tons per Mo.		5.50 Aver. K.W.H.	

Mechanical Mines Have Efficient Power Systems

An examination of this column brings out some rather curious things. First, considering the entire group of 120 mines that made an output of

3,647,000 tons per month, we find that these operations used an average of 6.43 kwh. per ton of coal mined. This, of course, includes hand and mechanical loading of all classes. Increased mechanization naturally calls for increasing quantities of electric power, so we would naturally expect to find the mechanical loading mines using a great deal more power than the hand mines; this, however, is not borne out in the tables.

Dealing first with averages, we find that the average for the hand mines of 6.46 kwh. per ton of coal in Table 5 was almost identical with the group average which also was rather closely approximated by the conveyor mines in Table 3, and the combination mechanical and conveyor operations in Table 4, with averages of 6.84 and 6.31 kwh. respectively. However, Table 2 shows that the mobile loading machines had an average of only 5.50 kwh. per ton of coal mined—much lower than that for the entire group, as well as lower than the individual figures for all the other methods of loading.

If we disregard averages and consider the upper range in each class, we again find that the high marks in power use are set by the all-hand-loading mines at 12.33 kwh. per ton. The conveyor and the combination mines almost equal that figure, while the high mark for the mines with mobile mechanical loaders is only 9.43 kwh. per ton.

The foregoing is difficult to explain with nothing but the figures in the survey to go on, although we know that there are of course some physical facts which have some bearing. However, it seems highly probable that these figures do at least indicate (if not prove) that the mechanical loading mines have the more efficient power systems, and use their power more efficiently than the other groups. While this explanation may have to be accepted as an assumption, nevertheless, it is in keeping with what is usually observed. Mechanical loading operations with highly paid group workers cannot afford breakdowns during the shift and delays from power failures—all of which add to the amount of kwh. used per ton of coal produced. Consequently, the mechanized mines, as a class, are almost always operated with better maintenance practices and better power systems than the average hand-loading mine and as a result of increased efficiency, the power cost is kept down to the point where it can hardly be considered an important added cost item in mechanization. Of course, it must be understood that the figures under discussion here do not include the purchasing, installing and maintaining transmission lines, sub-stations, and other line equipment, which are necessary for low-cost power.

Table 4

1945 DATA ON OPERATIONS WITH MECHANICAL AND CONVEYOR LOADING

Mine	(1) Seam Height Inches	(2) Average Monthly Tonnage	(3) Cost Per K.W.H.	(4) K.W.H. Per ton Coal	(5) Power Cost Per Ton Coal
35	50	19,526	1.58c	4.56	7.17c
36	42	21,455	1.41	6.65	9.36
37	45	22,848	1.69	5.06	8.54
38	48	54,209	1.27	7.38	9.37
39	60	71,466	1.19	6.83	8.14
40	60	73,133	0.91	10.14	9.18
41	66	98,393	1.16	4.52	5.72
42	40	11,225	1.11	6.39	7.11
43	46	25,563	1.33	4.75	6.33
44	54	50,721	1.38	6.27	8.68
45	40	15,561	1.59	7.86	10.88
		Total 463,649 Tons per Mo.		6.94 Aver. K.W.H.	

Table 5

1945 DATA ON OPERATIONS WITH ALL HAND LOADING

Mine	(1) Seam Height Inches	(2) Average Monthly Tonnage	(3) Cost Per K.W.H.	(4) K.W.H. Per Ton Coal	(5) Power Cost Per Ton Coal
46	44	10,379	2.23c	1.83	4.08c
47	48	10,423	1.76	3.37	5.94
48	48	10,906	1.60	7.43	11.86
49	40	11,368	1.90	3.15	5.98
50	42	11,504	1.53	6.98	10.62
51	38	11,569	1.78	10.51	18.62
52	40	11,930	2.36	2.15	5.09
53	45	14,664	1.70	5.47	9.23
54	46	16,050	1.65	8.33	13.77
55	48	17,769	1.56	5.09	7.93
56	44	18,442	1.49	8.24	12.30
57	38	21,086	1.26	12.33	15.55
58	40	21,517	1.47	7.52	11.04
59	42	21,820	1.51	8.66	5.75
60	40	22,061	1.62	4.23	6.86
61	50	22,714	1.72	7.04	12.11
62	54	24,476	1.37	6.51	8.90
63	52	28,790	1.30	9.30	12.06
64	46	29,469	1.51	6.07	9.14
65	60	29,865	1.37	7.98	10.94
66	50	36,331	1.52	5.26	8.01
67	49	47,040	1.30	5.01	6.49
68	57	49,355	1.21	7.05	8.55
69	45	19,215	1.65	5.50	9.07
70	39	19,323	1.48	6.61	9.71
		Total 538,066 Tons per Mo.		6.46 Aver. K.W.H.	

Table 6

DISTRIBUTION OF TOTAL POWER USED AT MINES OF ONE COMPANY HAVING AN ANNUAL AVERAGE PRODUCTION OF OVER 4,000,000 TONS

Year	Hoists K.W.H.	Fans K.W.H.	Tipples K.W.H.	A. C. Pumps K.W.H.	D. C. Power K.W.H.	Total Power K.W.H.
1943	.981	1.16	.652	2.39	5.30	10.78
1944	.951	1.21	.628	1.85	5.14	10.39
1945	.902	1.35	.624	2.38	6.17	12.20
1946	.954	1.52	.613	2.36	6.08	12.23

Mechanical Mucking in Inclines

By CECIL A. FITCH, JR.
Assistant General Manager
Chief Consolidated Mining Co.

Mucking of Inclined Shafts Has Always Been a Prime Headache of Mine Development. By the Installation of Sheaves and Guides Bolted or Welded Directly to the Wheels of a Standard Mucking Machine, Chief Consolidated Was Able to Cut Mucking Costs by Two-thirds. Equipment Alteration of This Nature Is Not Difficult and Can Be Done Frequently by Mechanics at the Mine

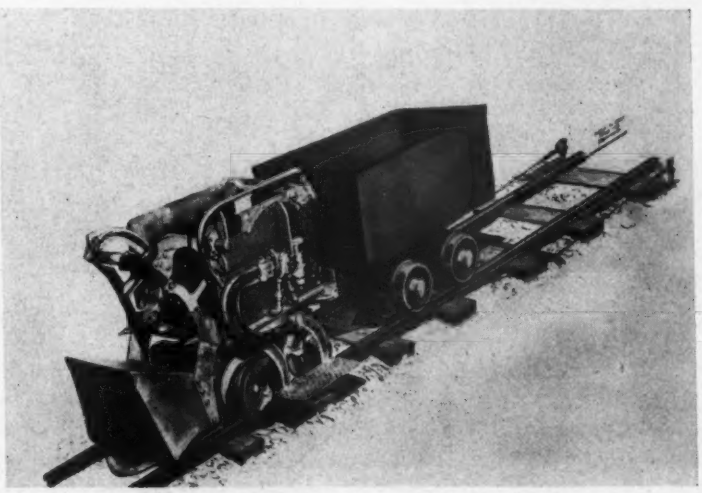
SHORTLY before the war the Chief Consolidated Mining Co. was running an incline from the nine hundred level on the Apex Standard property. It was during this period that Sam Colovich, who was our foreman at that time, conceived the idea of using a standard Finlay mucking machine to take the place of hand mucking, which was both expensive and slow. However, it was not until 1942, when we were developing an ore body on the 1,800 level of our No. 1 shaft that his idea crystallized.

At that time we were starting an incline which dipped, to begin with, about 12 degrees, and later steepened to a pitch of 23 degrees. This incline followed an ore shoot of lead zinc, and we were having little success in making any headway by hand mucking. As an experiment, we decided to try using a standard Eimco-Finlay model 12B mucking machine to increase the tonnage. Our machine operators were very experienced, since the machine had been invented and developed in the Tintic District, and we were able to greatly increase production. There were, however, several serious drawbacks to this operation. In the first place, the traction of the machine on the 12-lb. rail which we were using was not sufficient to support the weight of the operator on the stand along with a load of muck; consequently a tall man was needed who could stand in one place and stretch forward when loading the bucket, and bend backward when emptying it. The mine car was held in place on the incline by the cable with which it was lowered by a tugger at the collar of the winze; so the mucker did not have to handle the weight of the car. Secondly, the lighter machine which we were using had a tendency to tip forward as the load was being picked up and this necessitated placing a heavy weight on the back of the machine. The third and most serious drawback was the danger of the machine losing all traction and slipping down to the face of the incline, then turning over. This happened one afternoon and narrowly missed inflicting serious injury to two bosses who were inspecting the face. Shortly after this, King Sam, as he was called, came forth with his invention for positive control.

At this point I would like to mention an operation in which an Eimco 21 mucker was used in driving an incline at an angle of 18 degrees for 300 ft. without special attachment. According to the report they had no trouble mucking out 50 two-ton cars in less than a shift, and it was not necessary to weight the back end of the machine. The success of this operation was probably due to the fact that the Model 21 mucker is much heavier, and that the 40-lb. rail used gave much better traction.

The positive control device for mucking machines in inclines is very simple and has been little improved upon since it was invented. Essentially it consists of drums attached to the front wheels of the machine on which are wound cables attached to spikes driven in the ground in back of the machine. To throw the center of gravity back far enough the cables from the drums are run over idler pullies attached to the back axles and the down pull on the cables is achieved by pushing a bar under the track and over the cables approximately 6 ft. in back of the machine. Normally, during the course of mucking up a round this bar has to be brought forward several times, but the spikes only have to be moved when the drums have run out of cable.

For our purposes we found that the slide rails could be the same size



This equipment was used on a 23-degree slope

rail laid sideways and spiked firmly against the standing rails. However, the larger machines have a double flanged set of wheels which permit the use of upright slide rails of narrower gauge which can be pushed ahead into the muckpile.

Machine Used on Coal Mine Inclines

There have been few inclines run with mucking machines with the use of this attachment which I have been able to get information on, but a letter from Mr. M. M. Kaiser of the Eimco Corp. gives a brief resume of an incline run by the Appalachian Constructors, Inc. The model 21 mucker described in this letter has a 7½ to 10 cu. ft. bucket in comparison to the 4½ to 6 cu. ft. bucket which was used in our operations. It is also for a wider track gauge than ours, which is 17 in. A portion of this letter follows:

"This operation is at the Nora Mine of the Consolidated Coal Company, Nora Mine, W. Va. Jim Jackson is job superintendent. This property is near Shinston, W. Va.

"A Model 21 rockershovel with snubber attachment is being used for this operation and this loader includes a specially designed bucket step-plate and internal construction especially for operation on an 18 degree or 32 per cent slope.

"The slope being advanced on this property is 9 ft. high and 18 ft. wide. They are using a single track advance with a narrow gauge; center track extension as used with Eimco double flange wheels, illustrated in the attached Bulletin No. L-1007 on page 23. Track gauge is 42 in.

The lighter mucking machine uses an idler drum on the rear wheels to prevent upsetting when the dipper is loaded

"The slope being 18 ft. in width is worked in two 9 ft. faces, one face being carried approximately 30 ft. in advance of the second 9 ft. section. In the advance 9 ft. section, the 42 in. permanent track is carried in the center. The drilling and blasting of the trailing 9 ft. section is done in such a manner so as to blast the rock on to the tracked section where it can be handled by the loader.

"This work is accomplished by employing three eight-hour shifts, with five men to a shift. This five-man group includes the hoist operator on the surface who doubles as a truck driver removing the hoisted rock to the dump pile.

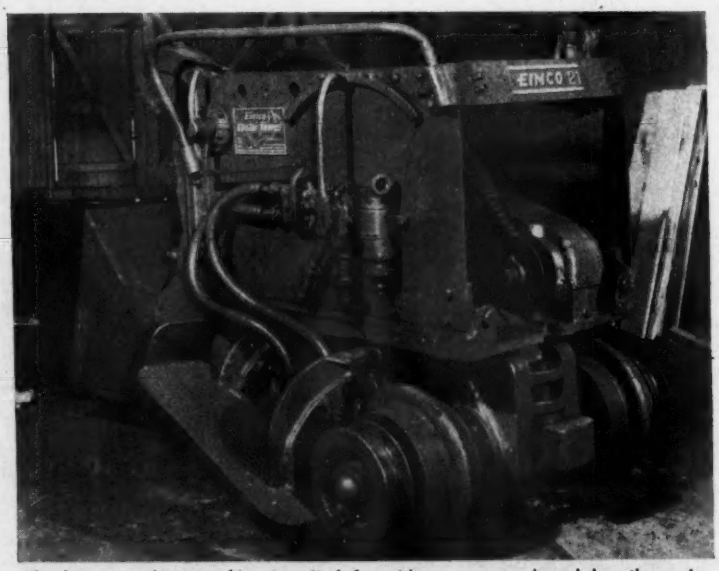
"On the first shift (8 A. M. to 4 P. M.) the loader is immediately placed into operation in the advance section loading out muck which had been blasted by the previous shift. The loading is done by one man. The other three men are occupied with drilling the trailing face, setting steel supports or pouring a concrete curb which is carried approximately 40 ft. behind the drilling face along each side of the slope. This curb is about 3 ft. high and the full width between curbs is 18 ft.

"The second shift (4 P. M. to midnight) repeats this operation and the third shift acts as a general cleanup crew, who do any hand mucking that may be necessary and laying of permanent track. They will also put in any steel sets that previous crew may not have been able to take care of. In this manner the advance is proceeding at the rate of 3 ft. for the full face per shift. This includes all aforementioned operations advancing with the face.

"The use of the loader in this type of a slope job, according to the job superintendent, has practically eliminated their mucking problem. Heretofore, getting the muck from the working face has always been a major operation. The adaptation of the rockershovel has speeded up face advance many times and has also made it possible to complete all allied operations as the face advances.

"The total length of the 35 per cent slope will be 65 ft. and thereafter it will continue at 11½ degrees for approximately 150 ft. At the bottom of this slope the loader will be changed over for level operation.

"The car used in conjunction with the loader has approximately 75 cu.



The heavy mucking machine is suited for wider gauge track and has the main drums on the rear axle

ft. capacity, and this car is loaded full in three to four minutes. The continued operation of the loader is dependent on hoisting up a full car, dumping it and returning the car to the loader operation."

Comparative Costs Indicate Effectiveness of Operation

The only comparative costs available to the writer were those concerned with our own operations, but they should give an indication of the effectiveness of using mechanical mucking in inclines.

The incline, mentioned at the beginning of this paper was run, for the most part, on a dip of 23 degrees. The winze was untimbered except for heavy track ties and ladders, and the average size of the winze before stoping of ore began was 5 ft. by 7 ft. A three-man crew per shift was used.

During the first half of the month this winze was started hand mucking was used with the resulting costs:

Thirteen shifts worked—Total tons, 48.

		Per ton
Labor	$323.47	$6.739
Air power	33.61	.70
Supplies	22.79	.475
	$379.87	$7.914

The second half of the month the mucking machine with winze attachment was used.

Thirteen shifts worked—Total tons, 201.

		Per ton
Labor	$779.73	$3.878
Air power	140.52	.70
Supplies	95.45	.475
	$1,015.70	$5.053

The next full month was spent in further sinking and stoping at the same time.

Twenty-six shifts worked—Total tons, 624.

		Per ton
Labor	$1,275.36	$2.044
Air power	287.21	.460
Supplies	206.22	.330
	$1,768.79	$2.834

			Per ft.
Labor			
Machinemen	$1,007.46		$5.193
Mucking Mch. Opr.	919.31		4.739
Tugger Hoistman	464.60		2.395
Misc. Labor	12.00		.063
	$2,403.37	$2,403.37	
Air Power	$170.25		.877
		$170.25	
Supplies			
Explosives	$153.88		.793
Timber	90.00		.463
Track	74.65		.385
Other	77.40		.399
		$395.93	
Total		$2,969.55	$15.307

One year later we put down a winze for a distance of 194 ft. This winze dipped 23 degrees and the average size was 5 ft. by 7 ft. It was untimbered except for ties and ladders and was run with three men to a shift. Two of these men were in the face while the third ran the donkey hoist and trammed the cars to the main switch. The labor contract was $12.39 per foot plus overtime. The costs for the total length of the winze are shown in the above table.

The average footage during the time the winze was run was 3.73 ft. per shift.

The obvious conclusion to be drawn is that mechanical mucking in inclines whether figured on a footage or per ton basis cuts the cost of the operation at least two-thirds over hand mucking. The individual factors involved in sinking a winze will dictate whether or not the positive control device is necessary. In our experience, using the smallest mucker, light rail and the desire for maximum safety, we have found the device well worth the cost and trouble.

British Coal Industry Nationalized January 1

THE National Coal Board took over Britain's mining industry on New Year's Day. Nationalization of the mines has been a plank in the Labor Party's platform for a generation and this measure has been taken with the hope of putting the industry back on its feet.

British coal output has been declining for more than 30 years. In 1913 its production was 287,000,000 tons and prior to the great strike of 1926, about 260,000,000 tons annually. In 1938 the figure was 227,000,000 and last year production was 174,000,000, insufficient for Britain's industrial needs.

In the past Britain was in a most favorable exporting position. British coal paid for many items imported from the European continent, products that Britain was not in a position to manufacture or process at home. For example: British coal could purchase Danish dairy products, Argentine beef or Italian mercury. Today's figures indicate that not only is Britain losing this favorable trade position but there is a coal shortage for domestic heating, railroads, and home industries.

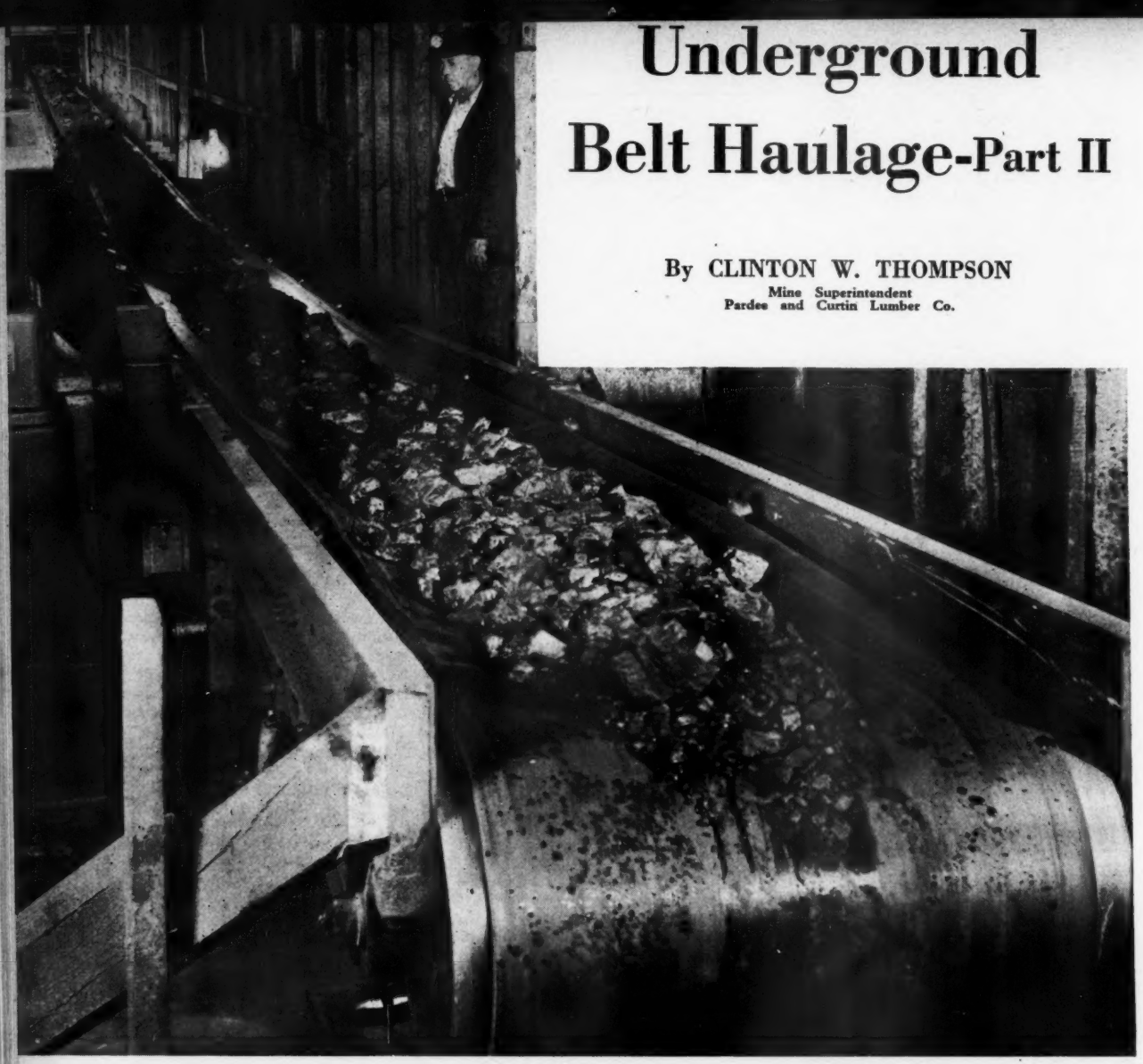
The Labor Government has not attempted to minimize the seriousness of the present situation. Furthermore it is admitted that the 1926 coal strike was sufficiently disastrous for its ultimate effects to be felt today. As result of this strike twenty years ago, the miner encouraged his son to leave the collieries and with a shortage of younger men available to coal mining today, age and increased absenteeism are taking their toll in coal production.

Another complication that adversely influenced British coal production was the existence of a large number of small uneconomic coal mines. The coal belonged to the land owner who often insisted upon operating his own deposit irrespective of his knowledge or experience in coal mining. In many cases no attempts were made to merge small and wasteful operations for more efficient production. The best engineering advice was frequently ignored—often mining engineers were not even consulted — and inferior equipment, inefficient methods, and hazardous underground conditions contributed to declining coal production.

With characteristic tenacity the British are attempting to meet this crisis. A nine man board headed by Lord Hyndley and including the former Secretary of the Trades Union Congress, Lord Citrine and Ebby Edwards, former Secretary of the Mineworkers' Union, has ausmed control of the coal mining industry. Whether or not this board will be successful in reviving this waning industry in Britain remains to be seen.

Underground Belt Haulage-Part II

By CLINTON W. THOMPSON
Mine Superintendent
Pardee and Curtin Lumber Co.



Steep Grades Ranging to 18 Per Cent Were Encountered in the Pardee and Curtin Bolair Mine. These Difficulties Were Overcome With Conveyor Belts and Their Efficient Use Has Made Possible the Economic Recovery of High Grade Coal Under Severe Operating Conditions

EFFECTIVE and positive electrical control of belt conveyors is a contributor to lower labor costs. An efficient and practical control system should include remote magnetic operation, jogging, dynamic braking, safety lockouts, protective devices for both belt and chain conveyors, automatic transfer control units and sequence operation of multiple units. These control steps should be possible, even with magnetic reversing, by the use of only a five-conductor control cable.

Tandem belt conveyor units, e.g., where one unit dumps on another to give continuous flow of coal over long distances, usually require interlocking devices to prevent spillage of one unit over another if for some reason an individual belt conveyor shuts down or fails to start in sequence of operation.

A control system has been successfully designed and installed which incorporates all features needed such as those mentioned above. The primary necessity for such a control system, when using tandem belt conveyor units, is the need for elimination of men at transfer stations. This means that we are at present saving approximately 24 to 26 manshifts, calculated on two shift operations, or a net saving of at least $260 in labor cost per day. The foregoing saving is being made possible at Bolair No. 1 mine. In Bergoo No. 2 mine, however, which is in low coal, we find that to handle supplies efficiently on belts it was necessary to have magnetic reversing and dynamic braking plus jog control. This arrangement permits the safe handling of supplies with a minimum of danger to the men on the job. Added features, such as being able to jog with dynamic braking and se-

quence interlock with magnetic forward and reverse operation, is attained while still holding to only five conductors in the control cable.

Jog operation coupled with dynamic braking is very important in the safe handling of supplies on belts in low coal. A demonstration of handling supplies safely and efficiently in Bergoo No. 2 mine is as follows:

Four men operate in a team with two men riding the belts ahead of the supplies. The two men riding the belt get off after they have reached the inby end of the last belt in the system and after they have stopped the belts by a conveniently placed push-button. The materials loaded on the conveyor at the outby loading station then are removed as they reach the end. In unloading or transferring materials from one conveyor to another one man controls the movement of the belt and the other handles the material. The man at the push-button station must, when jogging, hold his finger on the pushbutton. When he has been signaled by the man ahead that the belt has moved the desired distance, he releases the button and the belt stops almost instantly. After the desired quantity of supplies has been accumulated at the belt tail, the two men who have been loading at the mouth of the heading ride the belt in and assist in moving the supplies over the chain conveyor units to the working faces. When all supplies have been delivered to the faces the four man crew get on the belt conveyors, push the magnetic reverse button, and ride to the dumping point from which they move on to other sections that are to be supplied.

We have found that it is not good mining practice to attempt the handling of supplies on belt conveyors when a large number of units are in tandem operation. Thus, we use supply tracks for the transportation of men and material at Bolair No. 1 mine. The control system operates as follows at Bolair No. 1 mine: As the outside or No. 1 belt conveyor is energized when the mine is operating, each inby belt starts up in sequence until all units are moving throughout the entire system to the working faces. However, if for any reason a single belt fails to start in the system, all belts inby such points fail to start and a signal is flashed designating the location of trouble. On idle days an off automatic device is used which prevents the entire system from starting when a single belt is energized.

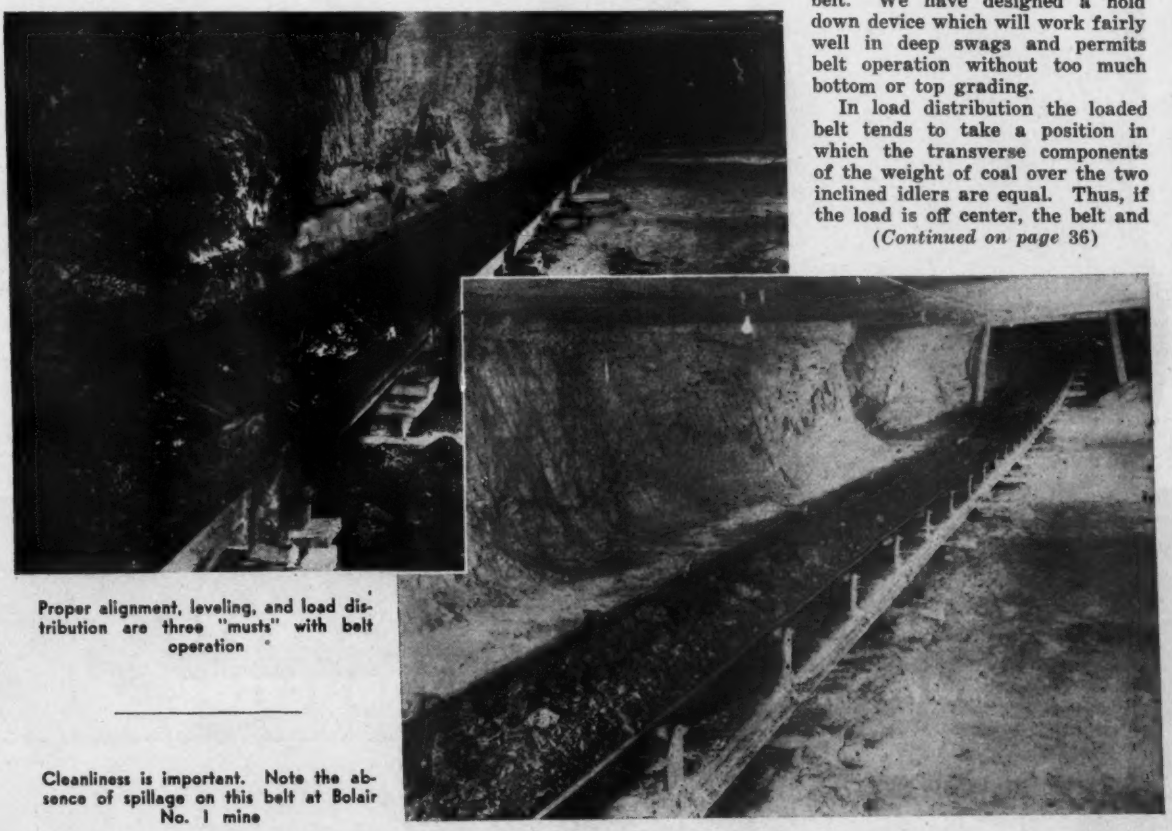
The Three "Musts" of Conveyor Operation

Proper alignment, leveling and proper distribution of load on the belt are three musts in the operation of belt conveyors. It might be pointed out that for operation in one direction only, training of the belt can be fairly simple because compensating misalignments can be introduced and the belt made to run on center with only minor effect on power and scuffing of the pulley cover. For operation in reverse, however, any compensating errors introduced for operation in one direction are opposite those required for reverse operation. Hence for two direction operation, such as handling supplies in reverse, alignment and leveling must be well nigh perfection. We have found where we have to use two direction operation the five-ply 28-oz. duck belting provides more efficient troughability and works out better when supplies are handled. Where supplies are not handled on belts we use four-ply 42-oz. duck to gain a certain amount of fastener strength.

Vertical curves cannot be overlooked in preventive maintenance where the seam of coal has abrupt dips and high humps. Essentially concave curves must be long enough to avoid lifting the empty belt under the greatest tension including accelerating tension which must exist at the curve. Convex curves must avoid excessive pressure on the idlers and excessive tension in the edges of the belt. We have designed a hold down device which will work fairly well in deep swags and permits belt operation without too much bottom or top grading.

In load distribution the loaded belt tends to take a position in which the transverse components of the weight of coal over the two inclined idlers are equal. Thus, if the load is off center, the belt and

(*Continued on page* 36)



Proper alignment, leveling, and load distribution are three "musts" with belt operation

Cleanliness is important. Note the absence of spillage on this belt at Bolair No. 1 mine

SULLIVAN COAL CUTTERS

HAVE A PROVED RECORD OF EFFICIENCY!

GOOD CUTTING MEANS LARGER LUMP AND FASTER PRODUCTION

Consult a Joy Engineer for "The World's Most Complete Line of Modern Mining Machinery"

Licensed under the patents to E. C. Morgan. No's 1,706,961—1,706,962—1,707,132 and 1,953,325

The Sullivan 10-BU Trackless Cutter above, trams faster; will top cut, middle cut, bottom cut and clean to produce more tons per man-hour, more coal per shift.

Licensed under the patents to E. C. Morgan. Nos. 1,706,961–1,706,962–1,707,132–1,953,325–1,953,326.

Sullivan 7-B Shortwall below, has high speed; short overall length for work in heading; variable feed control; complete circulation; and slow speed, heavy duty motor.

The Sullivan 7-BU is a fast and flexible universal track cutter. Cuts anywhere between roof and floor of seam, with 30% longer reach.

Joy Loaders, like this 11-BU, pair off with Sullivan cutters to speed production, set new records for mining economy in many mines throughout the nation.

SULLIVAN DIVISION

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING, PITTSBURGH, PENNSYLVANIA

load move transversely until this condition is met. In addition to the matter of centering the load, it is desirable that the cross section be kept as great as possible to obtain the best pattern of cover wear.

Proper Splicing far from a Simple Problem

Our Flexco plates, the Goodman hinged Flexco and the individually hinged Flexco used by a number of companies are practically the only types of joint encountered, with Flexco plates predominant. Ends of the belt are commonly cut square which is fairly simple on a new belt, but which may require a center line established over some length of belt if edges become battered in use. In a few cases experiments have been made with belt ends cut on a slight arc to improve the distribution of tension on the fasteners. There is also a method of cutting the belt ends on a diagonal line about 22½ degrees off the square cut—still keeping the fasteners parallel to the edge of the belt. This has the advantage that the joint strikes each roller and the pulley progressively, rather than all at once. Whether it has any real advantage in joint life is debatable. It is hard enough to get some people to cut the belt ends straight and square without asking them to cut on the arc or bias. Many belt users make hard work of cutting a belt where it can be very simple. If a sharp knife is used and a series of cuts are made along a straight edge rather than sawing with the knife through the full thickness at one time no great difficulty should be encountered. Bending the belt slightly away from the surface being cut will free the blade and greatly simplify the cutting.

Vulcanizing joints on permanent conveyors is, of course, the ideal method in that it eliminates any fastener maintenance as well as hazard to the belt resulting from partial fastener failures. A prerequisite for vulcanized splices is sufficient takeup to handle variation in belt length from no load to full load as well as permanent elongation. This means takeup of 1 per cent to 2 per cent of the belt length except in the case of steel belts where ¼ per cent would handle all variation in length with ample reserve. We have vulcanization of all main haulage belts from the outside to inby surge gathering stations.

To guard against belt slippage, tearups and pileups from one belt conveyor onto another, we use a plugging switch which is mounted in under the top or loaded belt. This device, together with a two-coil lockout device, gives us the protection needed, both for belt and chain conveyors. Where chain conveyors are concerned the device not only prevents the running out of chain from in under the pans but also provides the necessary protection to prevent the chains from piling up on the belt conveyors, thus saving major damage to belts.

Protection of Belts Necessary at Loading Points

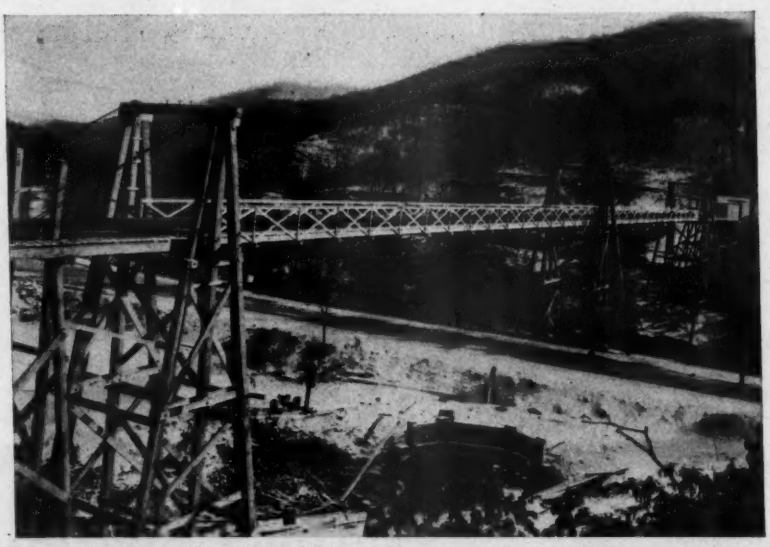
Mechanical devices, such as chutes to deliver heavy lumps with a minimum of vertical dropping of the lumps, are worth mentioning. In cases where the chute may interfere with lumps already on the belt from preceding loading points, it may be hinged and counterweighted so that it will lift readily. Additional protection of the belt at loading points by energy absorbing idlers is very desirable. All the equipment companies can supply impact idlers which will permit the belt to absorb blows many times as great as is possible over steel idlers without damage to the belt. Lumps dropping directly onto steel idlers from very moderate elevations can break the belt carcass. The ideal arrangement, of course, is the use of combined chutes with bar screens and energy absorbing idlers. Such arrangement gives a slack coal bed for heavy lumps and added protection by the energy absorbing idlers when large single lumps are dropping.

Lubrication and elimination of friction is a main part of preventive maintenance. Our belt conveyors are greased according to a predetermined schedule and each individual belt is greased according to speed. Records are kept of the greasing schedule and conveyors are periodically checked with wattmeters to determine laxity of greasing. However, caution should be exercised during lubrication that grease is not spilled. Such spillage is absorbed by the pulley surface and serious damage can occur causing a loosening of the pulley cover.

Wattmeter charts are extremely valuable not only in the checking upon adverse friction but also revealing, in some cases, such obscure information as the effect of a new loading point. Such readings show whether energy is imparted to the belt, is required from the belt, or ideally, no energy is required. Also watt hour meters read daily and compared with tons delivered by the system gives a good record of power consumption per ton.

Cleanliness is an absolute must in the efficient operation of belt conveyors. Coal spilled onto the deck at loading points and building up until the belt is actually dragging on coal not only damages the belt carcass but also creates additional drag which in direct proportion increases need for more energy. In addition to the preceding abrasive effect of such debris there is always the possibility of the belt being forced off to the side with much more rapid destruction resulting than from abrasion.

There is one other important comparison between underground belt conveyor haulage systems which cannot be overlooked; this is the depreciation angle. Labor, maintenance, and compensation savings have to be great enough in order to overcome quicker depreciating factors with belt conveyor haulage as compared with mine cars. One other thought is that the amount of haulage fatalities seems to be getting less each year. Could this be caused by the increase in number of complete underground belt haulage mines? Future increased tempo of complete belt installations will possibly answer such a question.



Construction of the suspension bridge for the conveyor from the mine to the tipple

A. M. C. Holds 49th Annual Meeting

A REPRESENTATIVE attendance of mining men from all branches of the industry were present at the 49th Annual Business Meeting of the American Mining Congress, held at the University Club in New York City on Wednesday evening, December 4.

Following dinner, President Howard I. Young called the meeting to order, and after discussing briefly the present status of the industry, called for reports of officers and committees.

In the secretary's report, Julian D. Conover reviewed the progress of the organization since the previous annual meeting in Washington in February, 1946. He reported continued gains in membership, and excellent cooperation by mining men in all parts of the country in the varied activities of the Mining Congress. Mr. Conover referred to the very successful meeting in Denver in September—the first full-scale Convention and Exposition for the metal mining industry since 1941—and to the plans being made for the largest Coal Convention and Exposition in history, to be held at Cleveland next May. He outlined the Congress' work on mechanization and the development of improved mining practices, with expansion in the activities of the Coal Division; the improvements being made in MINING CONGRESS JOURNAL; the service rendered by the organization in Washington in maintaining contact with administrative agencies and departments of the Federal Government and keeping the industry posted on all developments; and the work in presenting the industry's viewpoint on pending legislation to Congressional committees. Mr. Conover also reported briefly actions taken by the 79th Congress and legislative prospects in the coming session of the 80th Congress.

Erle V. Daveler, reporting for Chairman Andrew Fletcher of the Finance Committee, advised the members that the Mining Congress had again succeeded in keeping expenditures within income and maintaining a strong cash position.

Henry B. Fernald, Chairman of the Tax Committee, after discussing the Government's budgetary situation and the prospects for tax reduction in 1947, reported several recommendations of the Tax Committee on which it was felt that action at the earliest practicable date is needed. Among the proposals which he advocated were (1) a ceiling on the tax of any individual so that in no case will the total tax exceed 50 per cent of income; (2) a start toward eliminating double taxation of corporate income by making dividends received by the shareholder exempt from the first bracket rate of individual income tax; (3) gradual reduction in corporate taxes to a peacetime rate of not over 25 per cent; (4) a revision of the net loss carry-over to eliminate discrimination against percentage and discovery depletion; (5) adoption of a "tax benefit rule" under which depreciation deductions would be charged against the depreciation base only to the extent that they actually produced a tax benefit; (6) allowances of development costs as ordinary operating expense; and (7) suitable definition of "mineral property" and "net income from the property." Mr. Fernald emphasized that the purpose and major effect of such changes is not to reduce Government revenue, but rather to preserve the incentive which is needed in order to maintain the flow of revenue.

Howard Huston made a brief report for the Social Security Committee, summarizing action in the past year on proposed changes in the social security law. Brief but vigorous talks were also made by the three Vice Presidents of the Mining Congress, Donald A. Callahan, James D. Francis and Louis S. Cates, in an informal discussion of the industry's problems for 1947.

The following directors were unanimously elected to serve for three years: V. P. Geffine, James R. Hobbins, J. J. Huether, Neil W. Rice, Merrill E. Shoup, Grant Stauffer and Howard I. Young.

Following the membership meeting the Board of Directors met to elect officers and to consider various items of business. The following were unanimously reelected to serve for 1947: President, Howard I. Young; Vice Presidents, Donald A. Callahan, Louis S. Cates, James D. Francis; Secretary, Julian D. Conover; Executive Committee, Howard I. Young, Louis S. Cates and W. J. Jenkins.

The Board also considered a request made at the Denver meeting by Secretary of the Interior J. A. Krug for the formation of a small advisory committee to work with the Interior Department on policies and programs affecting the mining industry. Naming Howard I. Young as Chairman, the Board appointed a committee representing the various branches of mining, as reported on page 51 of this issue.

Harry M. Moses, President of H. C. Frick Coke Company, was again elected to serve as Chairman of the Coal Division, and 36 leading men in the bituminous and anthracite industries were appointed to serve with Mr. Moses on the Division's Advisory Council.

The Board also expressed its approval in principle of the Declaration of Policy adopted by the Western Division at Denver, Sept. 12, 1946.

The 1947 Coal Convention And Exposition

Organization of Preliminary Program Completed . . . Speakers Being Invited for Main Papers
More Than 160 Manufacturers Already Planning Full Range of Exhibits

PLANS for the 1947 Coal Convention and Exposition are moving rapidly forward. Held at the Cleveland Auditorium, May 12-15, this will be the first full-scale meeting of the coal industry since 1941. The Exposition will open Monday morning, May 12, and close Thursday evening, May 15; the convention will have morning and afternoon sessions on Monday and Thursday, but on Tuesday and Wednesday there will be morning sessions only, leaving the afternoons free for viewing the exhibits.

Convention Program

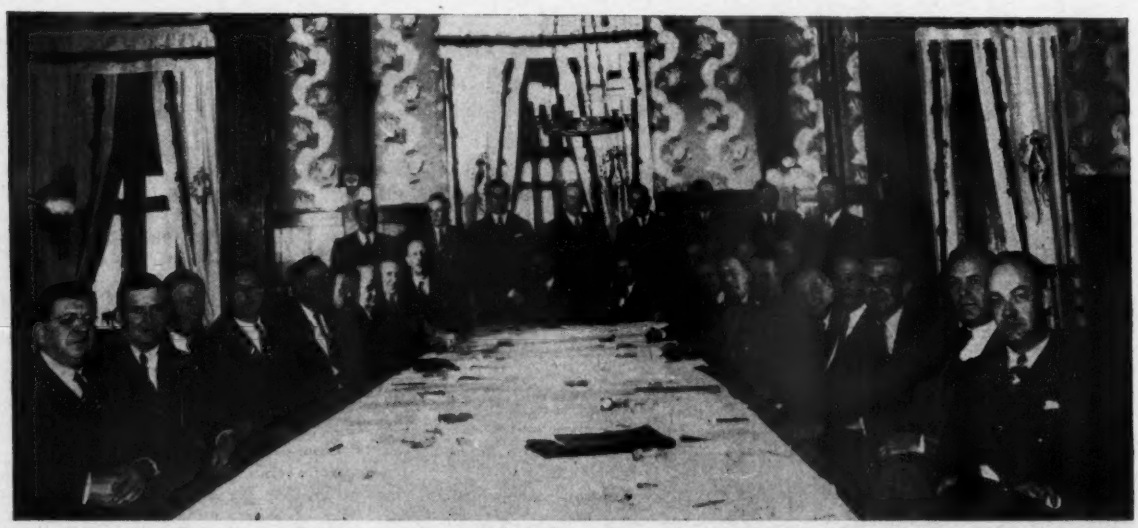
The preliminary program as framed by the Program Committee, under the chairmanship of George H. Love, President, Pittsburgh Consolidation Coal Co., covers a wide range. The committee has endeavored to key the papers into the convention theme—efficiency—by having the authors stress ways to improve labor and machine performances, and to eliminate waste and lost motion in every phase of underground and surface operation.

Mechanical mining will, of course, be covered in all of its details—loading with track and tractor mobile machines, as well as with stationary types; haulage with mine cars, belts and shuttles; safety practices, coal cleaning and face preparatory work. The trend toward complete mechanization and a greater use of mechanical power is the primary development today and new designs will be described that are pointing the way toward still further improvements in mining practices.

As a special feature, open meetings of the Coal Division Committees will be held where committee reports will be presented and discussed from the floor. Everyone interested in the subject matter of these reports will be invited to attend and to take part in the discussions.

Exposition of Equipment

The exposition of mining machinery and equipment will be by far the greatest ever held, with an area approximately twice as large as heretofore. More than 160 manufacturers have already reserved space, including many newcomers to the Coal Show. Exhibits will include everything used in coal mining from all types of underground machinery, haulage equipment and surface preparation units to the small hand tools and all the various specialized materials that enter into mining operations. The manufacturers plan to capitalize fully on this first opportunity in six years for showing their wares, and the industry is assured a mining show well worth anyone's time to visit. Of particular interest will, of course, be the developments of the wartime years, many of which will be presented for the first time.



Committee outlines program for 1947 Coal Convention—Uniontown, Pa., November 19, 1946

American Mining Congress Annual Coal Convention

CLEVELAND, MAY 12-15, 1947

Preliminary Program

MONDAY MORNING—MAY 12

General Session

Phases of labor and economics by speakers from coal and other industries.

MONDAY AFTERNOON—MAY 12

Surface Preparation Session

(1) Recovery of commercial coal from mine refuse and tipple rejects as a means to increase production.
(2) Laboratory control of washing plants by analyses during the shift to check quality of prepared products.
(3) Clarifying washery water and using closed circuits to conserve water and reduce sludge loss.

Safety Session

(1) Safety progress and accident prevention records in coal mining as compared to other major industries.
(2) Mine fire prevention by removing hazards and installing extinguishing system.
(3) Man-trip equipment and operation for safe and efficient transportation underground.

TUESDAY MORNING—MAY 13

Mechanical Loading Session

(1) Stationary mechanical loaders showing mining methods and conditions.
  (a) Power Duckbill operations.
  (b) Shortwaloader operations.
(2) Comparing the efficiency of mechanical loading with large and small crews.

Strip Mining Session

(1) Drilling and blasting with various types of drills and explosives.
  (a) Anthracite practices.
  (b) Bituminous practices.
(2) New developments in strip mining, equipment and practices.

Open Session—Coal Division Committees

Committee reports will be presented for general discussion from the floor on:

(1) Mine haulage with tracks and belts.
(2) Underground power systems.

WEDNESDAY MORNING—MAY 14

Underground Haulage Session

(1) Economic limits of shafts and slopes, including cost of sinking, installing and operating.
(2) Supply haulage in trackless mining from the surface to the working face.

WEDNESDAY MORNING (Continued)

(3) Hauling supplies and repairs in shaft mines with mine car mechanical loading—including underground and surface shops.

Strip Mining Session

(1) Material handling in open pit operations with various types of equipment:
  (a) Anthracite practices.
  (b) Bituminous practices.
(2) The use of alloy steel in machinery construction to give greater shovel range and higher efficiency.

Open Session—Coal Division Committees

Committee reports will be presented for general discussion from the floor on:

(1) Full seam mining—underground practices and surface preparation.
(2) Pillar recovery methods and roof action.

THURSDAY MORNING—MAY 15

Gathering Haulage Session

(1) The car capacity factor in mobile loading; how to determine the economic mine car size for track loading.
(2) Time studies for shuttle car gathering to improve the performance of a loading unit.
(3) Track construction and haulage system for direct car loading at the working face.

Strip Mining Session

Reclaiming stripped lands—an open report by the Land Use Committee, describing and discussing reclamation procedures in the several strip mining states.

THURSDAY AFTERNOON—MAY 15

Face Preparatory Session

(1) Bugdusters for shortwalls to reduce dust and improve kerf cleaning.
(2) Rubber tired equipment to decrease tramming time in trackless mining.
  (a) Rubber tired cutting machines.
  (b) Rubber tired drills.
(3) Mine timbering machines in track and tractor mechanical loading.

Open Session—Coal Division Committees

Reports by the Safety Committee on several important phases of accident prevention will be presented for general discussion from the floor.

To permit more time for viewing the exhibits, no sessions will be held on Tuesday or Wednesday afternoons

WHEELS OF GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

CONVENING January 3 under the new Republican majority, the 80th Congress promptly chose its leaders for the next two years. Arthur H. Vandenberg, of Michigan, is President Pro Tempore of the Senate; Wallace H. White, Jr., of Maine is the Majority Leader, and the Minority Leader is Alben W. Barkley of Kentucky, who led the majority in the 79th Congress. Joseph W. Martin, Jr., of Massachusetts is Speaker of the House, Charles A. Halleck of Indiana is Majority Leader and the Minority Leader is the former Speaker, Sam Rayburn of Texas.

Senator Eugene D. Millikin of Colorado will be Chairman of the Senate Finance Committee and Representative Harold Knutson of Minnesota of the House Committee on Ways and Means. The Senate Committee on Labor and Public Welfare is under the Chairmanship of Robert A. Taft of Ohio, and the House Committee on Education and Labor has for its Chairman Representative Fred A. Hartley, Jr., of New Jersey.

A rather moderate tone marked the President's message on the "State of the Union." The general reaction among members of Congress was that it supported the probability that remedial labor legislation will be enacted into law. In speaking of natural resources, Mr. Truman said: "I must advise the Congress that we are rapidly becoming a 'have-not' nation as to many of our minerals. The economic progress and security of our country depends upon an expanding return of mineral discovery and upon improved methods of recovery. The Federal Government must do its part to meet this need."

On December 31, anticipating action by the incoming Congress to do away with war-time powers, the President proclaimed the termination of hostilities in World War II. It was emphasized that the "state of war" has not been terminated and that the states of emergency proclaimed in 1939 and 1941 likewise have not been terminated. The proclamation did terminate the Government's authority under the Smith-Connally and Selective Service Acts to seize strike-bound plants, and the power of the Government to operate such plants terminates in six months.

Travel-Time Pay

Claims and suits aggregating $4 billion for travel-time pay under the Fair Labor Standards Act are now pending and early legislative action is expected by Congress to correct this impossible situation. In the Senate, a Judiciary Subcommittee will open hearings January 15 on the Capehart (Rep., Ind.) bill, offered as a remedy.

Senator Capehart's measure would limit the coverage of suits to one year after the cause of action accrued. Causes of action which accrued prior to the effective date of the Act, and are not barred by any applicable statute of limitations, may be commenced within 90 days after such effective date, but recovery under any cause of action already approved would be limited to one year. No recovery would be permitted for any period during which the employer was complying with the law as then interpreted and enforced by the enforcement authorities.

"Work" is defined to mean only those activities of an employe which are specifically paid for as such by his employer, "either pursuant to practice or custom at the plant or other specified place where such employe is employed, or pursuant to the express provisions of an agreement at the time in effect between such employer and such employe . . . " It is specifically provided that in determination of such practice or custom, effect shall not be given to the fact that the employer has, in an effort to conform to judicial decision or the Wage-Hour Administrator's rulings or practices, paid for certain employe activities for which he had not previously made specific payment. The "work-week" is defined to include "only time spent by an employe in performing work."

The bill drops the double damages penalty unless "the Court finds that such violation was in bad faith and without reasonable grounds"; the allowance of attorney's fee is also dropped. It is also specified that liability or punishment of the employer shall not be predicated on any action, now pending or hereafter commenced, on any act heretofore or hereafter done or omitted in good faith in accordance with or in reliance on any regulation, order, interpretation, ruling, or practice of the Administrator, notwithstanding the fact that such regulation, order, interpretation, ruling, or practice, after such act or omission, has been or is amended, rescinded, or determined by judicial authority to be invalid or without legal effect.

It is provided that any employe may settle or release any claim, either before or after commencement of suits thereon, such action being a complete bar to any further action for wages or damages under such claim. This feature also applies to waivers or settlements previously made.

Washington Highlights

CONGRESS: Convenes January 3; organizes promptly.

TRAVEL-PAY: Suits total $4 billion as Congress speeds remedy.

LABOR LEGISLATION: New Case bill before Senate; Ball would outlaw closed shop and industry-wide bargaining.

SUPERVISORY EMPLOYES: Supreme Court and Congress to act.

COAL MINES: Operators Negotiating Committee dissolves.

TAXES: "Quickie" cut for individuals.

TRADE AGREEMENTS: CRI hearings this month.

FREIGHT RATES: ICC grants increase.

Labor Legislation

The work which Senator Joseph H. Ball of Minnesota, Representative Francis Case of South Dakota and their associates did on the Case bill, vetoed last July, and the labor of Senators Ball, Taft of Ohio, and H. Alexander Smith of New Jersey, has crystallized in a revised version of this measure just introduced. The bill has the approval of the Majority Conference. Early hearings will be conducted by Chairman Taft of the Committee on Labor and Public Welfare and the measure is expected to be on the Senate floor by mid-February.

The Ball-Taft-Smith bill, as introduced, calls for a Federal Mediation Board of five members. When settlement of a labor dispute has failed, after resort to conciliation and mediation, the Board would request the parties in dispute to arbitrate. A 60-day cooling-off period is required in cases in which the Board intervened. The bill requires a financial accounting by union officials; denies protection of the Wagner Act to those engaging in wildcat strikes, but such denial would terminate upon reemployment; makes collective bargaining agreements enforceable in the courts; excludes supervisory employes from coverage of the Wagner Act; and outlaws secondary boycotts and "any combination or conspiracy" impeding the free flow of commerce.

Senator Ball has also introduced a separate bill which would outlaw the closed shop, and a further measure which would outlaw industry-wide collective bargaining.

Many additional corrective labor bills have been introduced, including especially Representative Case's (Rep., S. Dak.) revision of his bill of last year. More inclusive than the Ball-Taft-Smith measure, it specifies unfair labor practices by employes under the Wagner Act and authorizes injunctions, by exemption from the Norris-LaGuardia Act, to prevent strikes burdening or obstructing commerce. To Chairman Hartley (Rep., N. J.) of the House Committee on Labor will fall the job of bringing forth suitable labor legislation in the lower house.

Supervisory Employes

While it is believed that Congress will move speedily on the Ball-Taft-Smith labor legislation under which supervisory employes would be excluded from coverage of the Wagner Act, the National Labor Relations Board on December 31 ordered the Jones & Laughlin Steel Corporation to bargain with the UMWA District 50 supervisory employes union. NLRB then moved for a test of its ruling in the Supreme Court. Previously, on September 16, the U. S. Court of Appeals for the District of Columbia had upheld the Government's right to enter into a contract with the Jones & Laughlin supervisory employes union. However, the appellate court emphasized that it was not ruling on the propriety of the NLRB certification of the UMWA District 50 Union as the bargaining agent for such employes.

Meanwhile NLRB has filed a memorandum in the Packard Motor Car Company supervisory employes union case, supporting the company's request for Supreme Court review of a decision directing it to bargain with the Foremen's Association of America. On December 9 the Supreme Court agreed to review the decision of the circuit court rendered August 12, which includes the statement that if the Packard foremen had been affiliated with the Union of Productive Employes, the decision might have been different.

Coal Mines Situation

The strike in the bituminous coal mines which began November 20 was called off by the mine workers' leader December 7. In the face of the determined position taken by the owners of the coal mines and the Government, abandonment of the strike by the UMWA was generally viewed as a quick about-face taken to save the union from destruction. After meeting on December 19 to discuss the reopening of negotiations for a new wage contract, the National Bituminous Coal Operators Negotiating Committee dissolved. Differences had arisen between the Northern operators and those of the South and West, the latter group desiring to wait until the Supreme Court decides the contempt case against John L. Lewis, until the court rules on the Government's suit for a declaratory judgment, and until Congress indicates its position on supervisory employes' and employers' contributions to welfare funds.

The U. S. Supreme Court will hear argument January 14 on the mine workers' appeal against their contempt conviction in the Federal District Court of the District of Columbia. The Supreme Court will also consider Attorney General Clark's petition, asking if the District Court had the power through issuance of a temporary injunction to prevent interference with the sovereign functions of the United States, and to protect the Court's jurisdiction to decide questions of law and fact incident thereto.

While the President's proclamation terminating hostilities prevents the seizure of any more mines, the Coal Mines Administration may if necessary hold the properties it is now operating until June 30. Coal Mines Administrator Collisson has taken over the operation of certain mines "for the account and risk of the Federal Government" because the operators of these properties refuse to pay the Krug-Lewis royalty of 5 cents per ton for the Welfare Fund. Naval officers have been appointed to manage these mines.

The Revenue Bill

As matters now stand, the House Committee on Ways and Means will probably begin consideration of Chairman Knutson's "quickie" measure in early February. The joint Senate and House Committee provided for in the Congressional Reorganization Act must first determine the legislative budget, with its ceiling on appropriations. Knutson has introduced a bill to reduce personal income taxes 20 per cent, retroactive to January 1. This reduction would apply to persons whose annual net income is less than $302,000; on higher income the average reduction would be about 10½ per cent. Individuals over 65 years of age would be given a personal exemption of $1,000. Under the measure the ceiling of an individual's tax would be reduced from the present 85.5 per cent to 76.5 per cent of his income. It is estimated that this bill would reduce annual Federal revenues by about $3⅓ billion.

Leaders in both House and Senate are warning that taxes can be cut only through the most rigid economy in Federal expenditures.

Foreign Trade Agreements

The following dates have been set for the appearance of witnesses at hearings on the proposed trade agreements before the Committee for Reciprocity Information: Barytes—January 20; pigments, including lead and antimony oxide—January 20; magnesite, graphite, mica, limestone spalls, fluorspar, bituminous and anthracite coal—January 16; manganese ore, nickel, iron and steel products—January 17; copper, lead, zinc and antimony—January 20; aluminum and tungsten—January 21; glass sand—January 28; and clay—January 29.

The appointment of General Marshall as Secretary of State is causing some discussion as to the possibility of a change in the attitude of the State Department toward lowering the tariff protection on metals and minerals, considered as strategic and critical by the armed services. Thus far mercury and lead have not appeared on the list of commodities subject to negotiations for reduction in duty, and it will be remembered that in previous trade agreements negotiated since 1934, no reduction was ever made in tungsten or antimony. It was always believed that this was due to the wisdom exer-

(*Continued on page* 53)

Annual Conference

The Coal Division

Committee Studies Reviewed and Plans Formed for Future Reports

COMMITTEES REPORTING

Conveyor Mining
T. F. McCarthy, Chairman
Coal Mining Dept., N. Y. C. R. R.

Haulage Roads
C. C. Hagenbuch, Chairman
Hanna Coal Co.

Mechanical Loading
E. H. Johnson, Chairman
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Power
C. C. Ballard, Chairman
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Surface Preparation
T. W. Guy, Chairman
Consulting Engineer

Ventilation
Stephen Krickovic, Chairman
Koppers Coal Division

THE Annual Conference of the Coal Division of the American Mining Congress held at the Summit Hotel, Uniontown, Pa., on November 21, was marked by a very gratifying attendance. Following the usual schedule, each committee had a separate meeting in the morning for a brief review of its studies and reports; in the afternoon, all committees met in general conference and each chairman gave a resume of reports completed and studies being undertaken.

There was a decided spirit of optimism apparent, with everyone looking forward to an acceleration in coal mine modernization. Plans are already underway for setting high records in performance efficiency with new equipment, new materials and improved operating practices in every department of coal mining.

A departure from established practice in the committee procedure is being inaugurated by having joint studies and reports made by two or more committees. This is altogether a logical development as there are few phases of mining that are complete within themselves and each operation has some effect on the operations immediately before and immediately after it in the sequence of mining. For example, mine transportation is not only a subject for study by the Haulage Roads and the Conveyor Committees, but the Power Committee must also be called on to make the report complete. Similarly, questions of full seam mining must be answered both by the Mechanical Loading and the Surface Preparation Committees. And so on through the entire list of subjects being studied by the division, as described in the following accounts.

PILLAR RECOVERY

Increased percentage of coal recovery is becoming a matter of growing importance to the industry and a report that was originally planned to investigate the roof action in pillar mining has now been expanded to include methods of extracting pillars with mechanical or conveyor loading. The study, which is to be made jointly by the Committees on Roof Action and Mechanical Loading, will deal with the question, not so much from the viewpoint of conserving a natural resource, but principally as a means to reduce mining cost. As stated in the preliminary report published in the September MINING CONGRESS JOURNAL:

"When coal is left unmined, a value which the company has partially paid for is being lost. That is to say, the cost of deadwork when driving a room entry—installing track, trolley, conveyors, doors, brattices, pumps, pipelines and sprinkling systems, as well as rockdusting, setting timbers, handling slate and paying for yardage—all goes against the coal in the panel and consequently the less coal mined from the rooms the higher will be the deadwork cost per ton. This point is mentioned here because it is often overlooked."

The work done so far by the committee has been in the nature of a survey, showing examples of pillar mining with mechanical loading and conveyors. The continuation of study will be to investigate the factors—physical and economic—that have a bearing on the percentage of coal that is, or can be extracted, with mechanical methods. These factors include the operating conditions of the mine, the characteristics of the rock strata above and below the seam, as well as certain economic considerations, such as labor cost of the recovery and the market quality of the coal recovered.

The study is to be made in two parts by two subcommittees. The first will describe practices in mines where the rock strata is of such nature that roof fracture lines can be maintained by breaking or subsidence. The second part of this study will be on mines where the roof strata cannot be made to break or subside (with practicable success) and some coal must be left in place as a roof support.

MINE TRANSPORTATION

The recent application of belts in underground service has broadened our ideas on mine haulage. Formerly there were only two ways of transporting coal underground and both were with mine cars—locomotives for the flat seams and rope hoists for the steeper pitches. Today we have belt conveyors, able to operate on most grades that are encountered in average coal mining, and therefore competing with ropes and with locomotives in both of their respective fields. However, since the majority of the coal tonnage is produced from seams with level or light grades, the real competition for mine haulage is between locomotives and belts. Each, of course, has special advantages and in order to show the type of service which these two transportation methods can offer within the competitive field of flat seams, a study is being conducted jointly by the Haulage Committee and the Conveyor Committee.

Their object is not to recommend for or against either class of equipment, but to see what fundamentals can be established that will apply generally to each method of haulage. For this purpose, the studies are being conducted along parallel lines, taking assumed similar conditions that, to the best knowledge of the committees, place both types of equipment on a direct competitive basis. On these assumptions, mine plans will be made and estimates prepared covering the installation, maintenance and operation of locomotives and belt conveyors.

It will not be the intent of the committees to say that the figures which they will present can be applied directly to any mine; it is, however, their aim to furnish basic figures to which factors may be applied to suit any given set of conditions. The following outline has been approved by both committees as the basis for their reports:

Proposal

1. Quantity to be 1,200 tons per shift of material—coal and rock—but considering peak loads of approximately twice the average tonnage.
2. Length of haul—one, two and four miles—determine critical point.
3. Grade of haulroad—level, 1%, 2% and 4% against the loads.

General Assumptions Applied To Both Types of Equipment

1. Sufficient height and width of entry for either installation.
2. Two-shift operation.
3. Average maintenance of equipment.
4. Depreciation to be 10% per annum on mechanical and electrical parts.

Assumptions for Conveyor Operation

1. Ordinary belt specifications that do not involve expensive construction in order to increase terminal centers.
2. Anti-friction bearings in idlers (3% friction).
3. Belt life to be five years for double shift operation.
4. Rubber manufacturing association standards for belts.
5. Belt installation to include supply track.

Assumptions for Track Operation

1. Anti-friction bearings in mine cars (15 lbs. per ton friction).
2. Twenty-five per cent adhesion for locomotive wheels with steel tires.
3. Ordinarily good track.

FULL SEAM MINING

As a means of utilizing mechanical methods to their fullest extent, full seam mining is coming into attention and primarily as an economy measure to reduce the mining cost. This reduction is brought about in two ways; first, by increasing the yield per ton through the recovery of additional coal and second, by eliminating delays to the face operation which occur when partings are removed by hand. The Surface Preparation Committee in a report published in the December MINING CONGRESS JOURNAL sums up the effect of full seam mining on the underground and surface operations as follows:

"With the high wage rate for hand picking, this development undoubtedly will become more widely practiced as time goes on. Actually it does not introduce any technical difficulties in mechanical separation other than to increase the burden of the cleaning plant, which can be answered by the simple addition of more cleaning equipment. The function of mechanical cleaning in full seam mining is to increase the productive time of the loading unit underground and to reduce coal costs by substituting mechanical for hand labor both in the mine and on the surface."

The Mechanical Loading Committee will cooperate in this study by covering the underground operation with particular reference to the labor saving and the increased production from the loading machine when mining the entire seams—coal and impurities—as compared to an operation where slate separation is made at the working face.

Further reports and descriptions of practices by operating companies will be compiled in the future and the Surface Preparation Committee will also study certain other phases of coal cleaning such as "The Relationship of Appearance to the Quality of Prepared Coal"; "The Relationship of Coal Losses to Large Percentages of Refuse" and, a "Summary and Digest of Statistical Data on Percentages of Refuse, Tonnage and Sizes of Coal Cleaning." The latter will be based on the records from the U. S. Bureau of Mines, taken over a period of years.

UNDERGROUND POWER

This committee has been quite active and its studies have covered a wide range of power phases. During recent months a color code for external motor and starter terminals was finished and circulated to the members of the Coal Division requesting comment. The approval was almost unanimous and the code has now been referred to NEMA for any further action they may desire to take in having it adopted as an American standard. Another report completed and published in MINING CONGRESS JOURNAL is on "Alternating Current Transmission for Mines," which gave a series of curves for simplifying the problem of designing underground power systems.

Insulated Cables are being reviewed to determine whether any changes should be made in the recommendations of the previous committee report on synthetic coverings. In view of possible changes in insulating and jacket materials, the study will cover splicing methods as well as a discussion on flame resistant cables. Another important question to consider is a recommended standard size of over-all diameters of mining cables which will permit the uniform selection of packing glands, etc.

An additional phase is the matter of handling cables underground. The heat generated in a cable is not only affected by the size of the conductor, but also by the manner in which it is used—whether reeled, piled loosely or laid out straight. Recommendations on this phase are being considered for a committee report.

Mine Haulage Systems

The Power Committee will cooperate in the study, previously described, that is being made by the Conveyor and Haulage Roads Committees on rail and belt transportation. Mining plans are to be prepared to show the complete transportation lay-out and the Power Committee will design the power systems for each type of haulage, showing sub-station locations, size of conductors, etc.

A. C. Wiring Devices are being studied in order to make general recommendations as to what type equipment would be most suitable for underground use. The studies for the time being will be confined to 600 volts and lower and will include face distribution boxes to the face machines, such as drills, loaders and conveyors and a room neck distribution box with remote control to be used in connection with several face operations. Also in preliminary form is a report on ratings of branch circuits.

MINE VENTILATION

In keeping with the modern trend, mine ventilation is entering the classification of an "exact science" and practices are getting away from "rules of thumb." The Ventilation Committee, in recognition of this fact, has outlined a comprehensive program of studies as shown in the following outline:

1. Simplification of methods for determining ventilation requirements and for checking results:
   (a) Standardization of methods for measuring air velocities.
   (b) Development of new devices for measurements.
   (c) Simple tables for reading differences in pressure and determining loss of head in airways.
   (d) Simple tables for translating air resistances to cost at different power rates.
2. Ventilation Requirements for Mechanized Mining.
   (a) Effect due to concentration of workings.
   (b) Effect of increased coal exposure due to rapid rate of mining.
   (c) Auxiliary ventilation of rooms or sections.
   (d) Means of improving face ventilation.
3. Air leakage, cause and effects, with suggestions for locating major leakages and for avoiding them.
4. Methods for cleaning air courses and keeping them in reasonably efficient condition; financing the maintenance cost.
5. Need for "Bleeders" and their proper location.
6. Sealing worked-out areas to prevent gas from moving into air circuit.
   (a) Methods of effective sealing.
   (b) Effect on total volume of air required.
   (c) Effect on acidity of mine water drained from worked-out areas.
   (d) Consideration of possible gas pressure and risk involved by sealing.

It is, of course, not possible for a small group to carry on all of these studies simultaneously and the above outline covers a program to be spread over several years. The first report as selected at the meeting was Item 5 —Need for Bleeders and their proper location. This, in the opinion of the committee, ranks as an item of first importance and the study is now under way.

CHARACTERISTICS OF MINE ROOF

This study was started by the Committee on Roof Action several years ago when it was stated that the purpose is "to place in the hands of the coal industry a practical means of planning roof support methods and advance forecasting of the roof action." This still remains the purpose behind the committee's work.

A number of reports have been made on methods of determining certain rock characteristics by laboratory examinations and in addition, the committee has also reported on actual experiments made in mine aircourses to prevent roof deterioration by applying a waterproof coating. The results of these studies were summarized in a report published in the April, 1946, MINING CONGRESS JOURNAL. Supplementing laboratory tests and examinations, a further study of roof rock is to be made by examinations of the strata at coal strip pits. At many such places the high wall exposure gives an excellent opportunity to make visual inspections of the mine roof, as well as to take any samples needed.

Other phases of roof action are to be covered by the committee, among which are methods of timber recovery. This is not necessarily a part of the report on pillar extraction, but rather refers to practices by mining companies who use (and recover) steel supports in the room advancement. The question to be considered is whether it is more economical to use cheap roof timbers for posts and crossbars and abandon them when the room is completed, or to use more expensive materials, such as steel or treated wood and recover it for reuse. This is standard practice with mine ties—both steel and wood—so there seems to be a possibility for an extension of the idea, although the committee does realize that roof timber recovery is more difficult than track tie recovery.

MINE FIRE PREVENTION

One of the important studies being conducted by the Safety Committee is on the causes of mine fires, outlining precautions for preventing their occurrence and describing methods of extinguishing. It is not the intent to include sealing practices (as these have been thoroughly described in many publications) but rather to recommend measures that will prevent fires from reaching the point where sealing becomes necessary. On the basis that "All fires are the same size for the first five minutes," the committee will endeavor to determine what can be done to keep mine fires within that time limit. The following points are to be included in the study:

I. *Combustibles Underground* — Coal, gob, doors, brattices, timbering, mine cars, cable insulation, rubber belts, oil, grease, explosives.

II. *Causes of Mine Fires* — Short circuits, overheating cables, loose track bonds, welding, open lights, blasting, spontaneous combustion, gas ignition.

III. *Fire Prevention*—Inspection, protective maintenance, employe training, discipline, firepoof doors and brattices, gob removal, rock dust.

IV. *Fire Extinguishing*—Pipe lines, tank cars, chemical extinguishers, dry ice, fire fog, rock dust.

V. *Life Protection*—Alarm signals, escape ways, underground shelters, separate air splits, fire drills.

Other phases of safety on which reports are being prepared, are "mine explosions" which will be based on records taken from investigations and "mine haulage" which will outline haulage hazards and recommend protective measures.

Proving That 2=1 (See Editorial Page 19)

Let $x=a$
Then $x^2=ax$ (Multiplying by x)
$x^2-a^2=ax-a^2$ (Subtracting a^2)
$(x+a)(x-a)=a(x-a)$ (Factoring)
$(x+a)=a$ (Dividing by x—a)
$x+a=a$
$2a=a$ (Substitution)
$2=1$

Personals

Charles R. Nailler was recently elected the operating vice president of the Pursglove Coal Mining Co., at a company board meeting in Pittsburgh. Mr. Nailler has been associ-

ated with the operations of coal mines since 1932. His headquarters are in the general offices of the Pursglove Coal Mining Co., at Pursglove, W. Va.

Vinton H. Clarke, formerly chief engineer of the Chelan Division of Howe Sound Co., at Holden, Wash., was recently transferred to the company's head offices in New York City. **Wellington S. Phillips** will take his place as chief engineer at Holden.

The man behind the scenes of many safety appliances that save lives in the coal mines, **Dr. William Parks Yant**, director of research for the Mine Safety Appliances Co., Pittsburgh, has been chosen as the 1946 recipient of the Pittsburgh Award of the American Chemical Society.

The award, given annually for outstanding service in chemistry, was presented to Dr. Yant on December 19 during a dinner meeting of the Pittsburgh section of ACS.

W. T. McCormick, of Ishpeming, Mich., safety director for iron ore and limestone operations of Inland Steel Co., has become supervisor of occupational hygiene for all the company's operations at Indiana Harbor.

William W. Amyx was recently appointed by Fairmont Coal Bureau as assistant to the director, Julian E. Tobey. Before the war he was associated with Appalachian Coals, Inc., at Cincinnati, Ohio.

Arthur T. Allen, who was formerly associated with the American Zinc Co. of Tennessee as geologist has joined the staff of Emory University in Georgia.

Paul D. Hess has been appointed to the field staff of Coal Heating Service Division, National Coal Association. Mr. Hess is well known among coal men in the middle west as result of many years spent in the bituminous industry in engineering and production work.

N. H. Mannakee, Jr., formerly connected with OPA and the administration of the Premium Price Plan for copper, lead and zinc, has gone into consulting mining engineering at Cascade, Mont.

Carl W. Meyers, president of the Colorado Fuel and Iron Corp., has announced the election of **A. F. Franz**, of Pueblo, Colo., as vice president in charge of operations. He will succeed **Robert T. Dunlap**, of Buffalo, N. Y., who has resigned.

Charles E. Whittle, chairman of the Public Service Commission of Kentucky, was recently named as State Coal Conservator by Governor Sam Willis.

John H. Hearding, Jr., Hibbing, Minn., has been appointed assistant general superintendent of the Hibbing-Chisholm district for the Oliver Iron Mining Co., R. T. Elstad, president, has announced. Mr. Hearding succeeds **Jerome E. Machamer**, who was recently appointed a vice president of the company.

J. Littlepage, who recently resigned from the Forest Resources Department of the Ohio Reclamation Association, has taken a position with the Greenland Coal Co., of Wheeling, W. Va. This company operates strip coal mines in the Greenbriar field.

Jarvis W. Berdick has been named bituminous sales manager at Bethlehem, Pa., by Weston Dodson and Company.

The appointment of **E. T. Powell** as mining engineer for Susquehanna Collieries Co. was announced recently by C. A. Gibbons, vice president and general manager. Mr. Powell was formerly mining engineer and assistant superintendent of No. 7 Colliery.

The appointment of **Oliver C. Ralston** as chief of the Metallurgical Branch of the Bureau of Mines in Washington, D. C., and the transfer of **R. G. Knickerbocker** to the position of chief of the Rolla, Missouri, Division of the Metallurgical Branch was announced early in December by Dr. R. R. Sayers, Director of the Bureau.

James A. Knight has been appointed assistant general manager of the Inland Lead and Zinc Co., Livingston, Wis. Mr. Knight was formerly from Cripple Creek, Colo.

The appointment of **William J. O'Connor**, general manager of the American Smelting & Refining Co., as Utah State Chairman of the Committee for Economic Development,

was announced by Walter Fuller, president of the Curtis Publishing Co., and chairman of the newly-formed CED national information committee.

Tom Stark of Holden, mining engineer for the Island Creek Coal Co., has been appointed chief engineer of the Cole & Crane real estate trust and the Dingess-Rum Coal Co., succeeding **Robert F. Carson**, who was retired last month from this position. A native of Scotland, Stark came to Huntington, W. Va., in 1912. He will be located in the First National Bank Bldg., Huntington.

Benjamin F. Fairless, president, United States Steel Corp., of Delaware, announced early in December the election of **Carl A. Ilgenfritz** as vice president-purchases, succeeding **Charles R. Miller, Jr.**, who has retired. Since September, 1945, Ilgenfritz has been vice president in charge of purchases, Carnegie-Illinois Steel Corporation. Mr. Miller retired December 1, after 49 years of continuous service with United States Steel subsidiaries.

H. M. Lavender Elected Chairman, Western Division, American Mining Congress. 1947 Meeting in El Paso

HARRISON M. LAVENDER, vice president and general manager of the Phelps Dodge Corporation, Douglas, Ariz., has been unanimously elected Chairman of the Board of Governors of the Western Division of the American Mining Congress.

In his new post, Mr. Lavender will play a leading role in the development of the plans for the 1947 Metal Mining Convention of the American Mining Congress, which will be held in El Paso, Tex., October 27-29.

This is the first time in 17 years that the Mining Congress has met in El Paso, the last meeting in that city being in 1930. El Paso is an important center for mining and smelting activities and for the distribution of mining equipment to the southwestern states and Mexico. The El Paso Chamber of Commerce and its International Mining Days Celebration will act as hosts to over a thousand mining men.

A. K. Snelgrove has returned to his position as head of the Department of Geological Engineering at the Michigan College of Mines and Technology. Through 1945 and '46 he was visiting professor of Geology at Rutgers University, where he established a new bureau of mineral research.

Cloyd M. Smith has opened offices in the Munsey Bldg., Washington, D. C. At the present time he is engaged in consulting practice and operating a small coal mine in West Virginia. Dr. Smith was the former editor of *Mechanization*.

John D. MacKenzie, general manager of the western smelting department (excluding Garfield and Murray plants in Utah) of the American Smelting and Refining Company, has announced that **Robert D. Bradford**, the present manager of the El Paso plant, will become manager of the Selby plant near San Francisco. **E. McL. Tittmann** for the past five years manager of the East Helena plant of the company, has been promoted to manager of the plant at El Paso, Tex. **Kuno Doerr, Jr.**, assistant manager of the Utah department succeeds Mr. Tittmann at East Helena. These changes will become effective during the first quarter of 1947.

William T. Folwell is now with Basic Mines, Inc., at Grass Valley, Calif. Folwell was formerly geologist and chief engineer with Basic Refractories, Inc., at Gabbs, Nev. He will continue to act as consulting engineer for Basic Refractories.

Donald R. Haake has become general superintendent of the Westmoreland Mining Co., at Blairsville, Pa. He was formerly assistant superintendent of Mine No. 1, Island Creek Coal Co., Holden, W. Va.

George Spencer, formerly with the Island Creek Coal Co. at Marianna, W. Va., has been made auditor of the Marianna Smokeless Coal Co.

A. D. Nicholas, secretary and treasurer of Calumet & Hecla Consolidated Copper Co. for 25½ years, retired voluntarily on December 31. Mr. Nicholas is a native of Michigan, where the mines of the company are located. He started with Calumet & Hecla as a warehouse boy on July 1, 1899, and has been continuously with the company since that date. Mr. Nicholas will be succeeded by James H. Elliott, who for the past three years has been assistant secretary-treasurer and comptroller.

Major William W. Inglis has resigned as president of Glen Alden Coal Co., but will continue as a member of the Directorate and as Chairman of the Board's Executive Committee. **Edward Griffith**, former vice president and general manager, has succeeded Major Inglis as president.

George Bush, formerly of Cleveland, Ohio, is now in charge of the Grantsville mill operations at Gabbs, Nev. Mr. Bush was formerly employed by Basic Magnesium in their Nevada operation.

C. E. McManus is now employed with the Clifton Iron Mining Division of the Hanna Ore Co. at DeGrasse, N. Y. Mr. McManus was formerly chief engineer for Butler Bros. iron mining operations on the Mesabi iron range in Minnesota.

Consolidation Coal Co. of Fairmont, W. Va. reports that **Leon F. Wilson** has been promoted from mine foreman to superintendent effective the first of the year. He replaces **George W. McCaa**, who was transferred to Mine No. 63, Monongah, as superintendent of this operation.

M. E. Harris, mining engineer, formerly of Redding, Calif., is now employed by the Calaveras Cement Co. and has changed his address to San

—Obituaries—

William Cunningham, 67 years old, general superintendent of the Linton-Summit Coal Co., Vincennes, Ind., died of a heart attack recently in his home. He had been with the company 30 years.

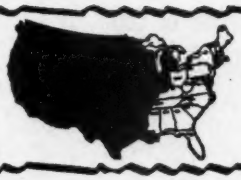
William R. Boyle, who was in the metal sales department of the American Smelting & Refining Co., died suddenly on Monday, December 2. Mr. Boyle went to work for the American Smelting & Refining Co., on August 6, 1906, as an office boy when he was not quite 15 years old and had remained with the company ever since, a period of 40 years.

Well known to the mining world of the Pacific Northwest and Alaska, **Charles Luther Ross** died recently at Bothell, north of Seattle, Wash., where he had retired. Sixty years old at the time of his death, he had resided in the area for 36 years, and made frequent trips between Seattle and Nome, where he had mining interests. He also conducted mining operations in Pierce, Idaho.

NEWS and VIEWS

A 34-pound gobbler, the biggest of 1,900 Christmas turkeys given to miners of the Pittsburgh Coal Company as awards for safety records during 1946, went to Walter Baumiller, right, a coal cutter at Montour 10 mine. He has worked 48 years in the pits without an accident, starting at the age of 10. Baumiller is telling Jack Honney, 22, youngest underground worker at the mine, about his experiences

Eastern States



BCR Expanding Research Program for 1947

Faith in the future of the bituminous coal industry was reaffirmed at Pittsburgh in December by the board of directors of Bituminous Coal Research, Inc., when it approved a budget of $447,200 for its general program of cooperative research and development projects to be carried on during 1947. This is in addition to large expenditures planned in 1947 for coal-burning gas-turbine locomotive research and development by the BCR Locomotive Development Committee. Howard N. Eavenson, president of BCR, announced that this budget was higher by $72,200 than the allotment made for research in 1946. The funds were made possible by voluntary contributions from coal companies and associations, coal-carrying railroads and coal-burning equipment manufacturers.

As in 1946, next year's BCR program will be an expansion as well as a continuation of development work begun earlier. In 1947, Dr. Harold J. Rose, vice president and director of research, Bituminous Coal Research, Inc., stated, the BCR projects will include six on railroad locomotive utilization of coal, 15 on residential uses, eight on industrial steam and non-steam uses, and two on mining and preparation.

Freeport Sulphur Dissolves Manganese Affiliate

Stockholders of Cuban-American Manganese Corp., an affiliate of Freeport Sulphur Co., have approved plans for the dissolution of their company. All assets of the firm are to be distributed pro rata to stockholders. Among such assets are 100,000 shares of capital stock, $50 par, which constitute all the authorized and outstanding shares of Cuban Mining Co., organized under the laws of Cuba. For each share of Cuban-American Manganese Corp. held, stockholders will receive 1/65th share of capital stock of Cuban Mining Co.

Freeport Sulphur Co., as owner of approximately 94 per cent of the common stock of Cuban-American Manganese Corp., will therefore become the owner of the same percentage of the capital stock of Cuba Mining Co. This company has been engaged in the production of manganese in Cuba. Its ore reserves have been depleted, however, and while it is still producing some manganese, the discontinuance of manganese operations is considered imminent.

Increased Demand for Anthracite Anticipated for 1947

Demand for hard coal in 1947 should remain high and is expected to balance production, Frank W. Earnest, Jr., president of Anthracite Institute, said in a year-end statement on the industry's outlook for the future.

"While competition among fuels undoubtedly will increase," Mr. Earnest said, "the outlook for anthracite during the next 12 months is favorable. The market for all fuels will be expanded by such economic factors as full occupancy of homes, new home building and continued high national income. In addition, the anthracite industry is aggressively working not only to protect its present market through consumer education but to expand it with a strong bid for new housing. Both of these activities are closely coordinated with the largest research program in the institute's history, aimed at increasing the customer's convenience and decreasing his heating costs by improving existing heating plants and developing new equipment."

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Possible Use for Anthracite in Synthesis Field

Although the complete calculation of performance have not been made of the gasification of rice and barley anthracite in an oxygen-blown Wellman-Galusha Gas Producer at the Consolidated Mining and Smelting Company of Canada, Ltd., Trail, B. C., the preliminary results are encouraging.

Dr. C. C. Wright, of Pennsylvania State College, concludes that rice and barley anthracite can be satisfactorily gasified with oxygen and steam to yield a raw synthesis gas suitable for use in synthetic ammonia, synthetic menthanol, or synthetic gasoline processes. The composition of raw synthetic gas produced in the oxygen gasification of rice anthracite was superior to that reported for coke in the same operation. It showed an appreciably higher content of potential pure synthesis gas ($Co+H_2$) per unit of carbon in the gas. The composition of this raw synthetic gas from barley anthracite was not as favorable, but this may have been due to the inability to establish optimum operating conditions. The purity of the synthesis gas from anthracite compared favorably with that produced from coke. The inert content was about the same, while tars and condensable residues were appreciably lower or non-existent. The tests were not of sufficient duration to determine the effect on the catalyst, equipment, etc. No trouble of any kind was experienced with the use of anthracite gas in the synthesis process during the three-week test period.

In the oxygen steam-blown producer it was possible to gasify rice at 100 per cent and barley at 200 per cent faster rate than in the same type producer using air and steam with the same two sizes.

The behavior of the anthracite ash in the oxygen-blown producer differs from its behavior in an air-blown producer. Therefore, in order to obtain optimum operating conditions, it will be necessary to do some experimental work on grate spacings and eccentricity of the grate sections.

Officers Elected at Meeting of Copper and Brass Research Association

The 26th annual meeting of the Copper and Brass Research Association was held December 3 at the Hotel Commodore in New York. A program for 1947 was approved. R. L. Coe of Chase Brass and Copper Co., Waterbury, Conn., was elected president of the association for the coming year.

Directory of Georgia Mineral Producers Published

The 1946 directory published by the State Division of Conservation of Georgia has just been published. This booklet lists the various operating mining companies throughout the state with information as to the product mined and location. Statistics on production are given through 1944.

Strip Mine Opened Near Wellston, Ohio

In November the Buckeye Furnace Mining Co. opened a large modern strip mine in the upper Freeport seam near Wellston, Ohio. This operation is on the Baltimore and Ohio Railroad. The operators of the new property are Frank C. Ford and Max Morrow, former owners of the Morrow Manufacturing Co.

U.S.G.S. Mergers Two Geophysical Research Groups

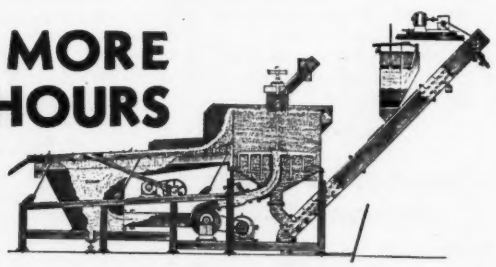
The division of Geophysical Exploration of the Bureau of Mines was transferred on November 16, 1946, to the U. S. Geological Survey, and absorbed into the Survey's section of geophysics. The consolidation was made in accordance with terms of a partial reorganization and redefinition of functions of the agencies of the Department of the Interior, recently agreed upon and aimed at maximum elimination of overlapping activities and previous duplication of effort with respect to mineral exploration and development programs.

The merger of the two geophysical research groups will permit greater and more effective utilization of latest geophysical techniques by the Geological Survey in its expanding program of mineral exploration, as well as in its related programs involving investigations in the fields of structural, stratigraphic, engineering and economic geology.

H. R. Joesting, of the Geological Survey, is Geophysicist-in-Charge of the consolidated section. F. W. Lee, chief of the former Bureau of Mines Geophysical Division, will henceforth devote his time to a special program of research in instrumentation.

SAVE MORE MAN HOURS

With the



NEW Automatically Controlled Wilmot Coal Cleaning Units

If you measure the efficiency of your coal-cleaning plant in yield per man-hour (and who doesn't, these days?) you will be intensely interested in the details of the new automatic controls recently added to Wilmot Hydrotators and Hydrotator-Classifiers. Saving man hours, these new controls also automatically prevent loss of good coal in refuse. Let us send you details.

Wilmot Builds Better Breakers

WILMOT
A GREAT NAME IN THE COAL INDUSTRY

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HYDROTATOR *Preparation* EQUIPMENT

WILMOT ENGINEERING COMPANY, HAZLETON, PA.

IN WIND, RAIN, SNOW OR HAIL • YOUR FREIGHT GETS THERE BY RAIL!

Facts Favor Your Future in the "Union Pacific West"*

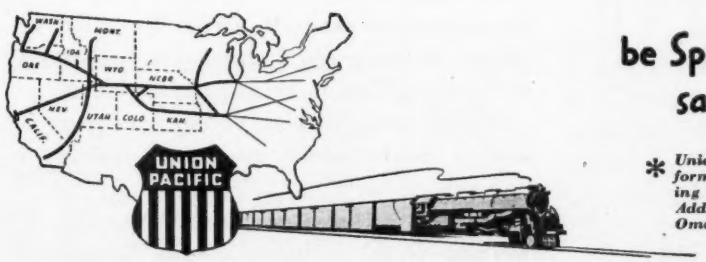
Of special interest to the Mining Industry

Fact 1. Since V-J day, hundreds of industrial and commercial concerns have located factories, warehouses and distribution facilities on the Union Pacific right-of-way in the western states served by the railroad.

Fact 2. This vast territory is rich in raw materials, natural resources, skilled and unskilled workers... with ideal living conditions, good schools, and plenty of space for future expansion.

Fact 3. Travel surveys show vacationists favor the western area by a wide margin. Result—greater interest in the West leading to permanent residence... growing markets, more manpower for industry.

Fact 4. Over its Strategic Middle Route, uniting the East with the West Coast, Union Pacific provides unexcelled rail transportation.



be Specific – say "Union Pacific"

* *Union Pacific will gladly furnish confidential information regarding available industrial sites having trackage facilities in the territory it serves. Address Industrial Dept., Union Pacific Railroad, Omaha 2, Nebraska.*

UNION PACIFIC RAILROAD

The Strategic Middle Route

Punch press frame repair-welded with 52 lb. of 3/8" Tobin Bronze by the Sutton-Garten Company, Indianapolis, Ind.

Saved from the scrap pile... with TOBIN BRONZE

WHEN this punch press frame fractured, Tobin Bronze* *repair welding* saved months of delay...and the purchase of a new frame.

The Sutton-Garten Company of Indianapolis, using 52 lb. of 3/8" Tobin Bronze Welding Rod, did the job in two days... one for preparation, one for welding. The press was out of service only four days.

Low-temperature bronze repair welding has become the generally accepted method for reclaiming worn, fractured, or broken equipment. This method...applicable to cast iron, steel, malleable iron or copper alloys...is also widely used for building up worn surfaces.

For detailed information on Anaconda Welding Rods, including Tobin Bronze and "997" (Low Fuming), write for Publication B-13. 45161

*Reg. U. S. Pat. Off.

ANACONDA

Anaconda

WELDING RODS

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

Central States

Illinois Strip Mine Law Held Unconstitutional

The Illinois strip mine law has been declared unconstitutional, both as an invasion of private property without benefit to public welfare and in being unreasonably discriminatory. Judge Phillip J. Finnigan of the Circuit Court of Cook County ruled that the state of Illinois is "enjoined from enforcing the Strip Mine Act and that said Act is unconstitutional," in upholding the findings of the Master in Chancery.

The Act, passed by the Illinois legislature in 1943, required leveling of coal strip mine lands to approximately original contour. It has been under injunction by the coal operators of that state since its enactment.

In announcing his findings, Master in Chancery Philip H. Mitchell held that leveling of the strip mine banks was not beneficial to growth; that it could not be used for row crop farming after leveling, and that the coal companies have improved the strip areas.

Underground Operations to Start On Barite Property

The Magnet Coal Barium Corporation of Melvern, Ark., is planning to start underground mining operations for barite ore in Hot Springs county. The company's production to date has been obtained by open pit mining from this barite ore body. The surface plant is largely completed and it is planned to start sinking an incline shaft. Alfred D. Rood is the engineer in charge of operations at Melvern.

Coal Producing Company Moves to New Property

It is reported that the Union Colliery Coal Company's big Kathleen shaft mine near Dowell, Ill., which has produced 24,000,000 tons of coal and millions of dollars in payrolls in its 28 years, has closed its colliery permanently. One of southern Illinois' biggest coal producers, the Kathleen had a peak employment of 800 and it employed 600 at the time the mine closed permanently, November 19. The operating firm has opened a "New Kathleen Mine" about five miles from Du Quoin, but it is not yet in full operation.

Scholarships Offered

To encourage interest in higher education which is regarded as essential to continued progress of all American industry, International Minerals & Chemical Corporation is announcing the establishment of several scholarships for residents in two of its most important plant communities, according to Louis Ware, president of the company.

The scholarships, each amounting to $600 annually towards a complete four-year college course, will be awarded each year to two of the most worthy applicants among the residents of Polk county, Florida, and Eddy county, New Mexico, as determined by local committees of educators, business men, employe representatives and company officials. The company's principal phosphate mine and refinery is located near Mulberry, Fla., in Polk county, while its big potash mine and refinery is located near Carlsbad, N. Mex., in Eddy county.

Two scholarships will be awarded annually in both counties. The company has stipulated that one be granted either to an employe or the son or daughter of an employe locally employed, and that a second be awarded to the son or daughter of a resident of each county not employed by International.

Oklahoma Coal Co. to Add Washer

The Seneca Coal and Coke Co. of Morris, Okla., is adding a washer of 300 tons per hour capacity to its present tipple. All-mine-run coal will be crushed in a 30 x 60-in. McNally-Pittsburg double roll breaker and the product will be washed in a compound automatic washer. Minus 10-mesh centrifugally dried coal will be loaded directly to a special track or mixed with various sized products delivered by existing classifying screens.

Great Lakes Shipping Tonnage for 1946 Shows Decrease

The total iron ore shipments from the Lake Superior region for the year 1946 were 59,356,716 gross tons. This is a decrease of 16,358,034 tons from 75,714,750 tons shipped in 1945. The peak year of iron ore shipments from the region was in 1942 when

A.M.C. Names Minerals Advisory Committee

The Board of Directors of the American Mining Congress has appointed a small committee to advise Secretary of the Interior J. A. Krug of the mining industry's viewpoint with respect to national mineral policies and the activities of the Interior Department dealing with minerals. The committee's formation was requested by Secretary Krug when he addressed the fall meeting of the Western Division, American Mining Congress, in Denver.

The committee, composed of representatives of the various branches of the mining industry, is as follows:

HOWARD I. YOUNG, Chairman,
Pres., American Zinc, Lead & Smelting Co.

Coal:	JAMES D. FRANCIS, Pres., Island Creek Coal Co.
Iron Ore:	R. C. ALLEN, Vice Pres., Oglebay Norton & Co.
Copper:	W. W. LYNCH, Calumet & Hecla Consolidated Copper Co.
Zinc:	EDWARD H. SNYDER, Pres., Combined Metals Reduction Co.
Lead:	ANDREW FLETCHER, Executive Vice Pres., St. Joseph Lead Co.
Other Metals:	WORTHEN BRADLEY, Pres., Bradley Mining Co.
Non-metallic Minerals:	H. M. ALBRIGHT, Pres., United States Potash Co.
Alternates:	DONALD A. CALLAHAN, Pres., Callahan Consolidated Mines, Inc. S. H. WILLISTON, Vice Pres., Cordero Mining Co.

92,076,781 gross tons of iron ore were shipped. Shipments by railroad are not included in these figures which include cargo tonnages only.

Gold Output at Homestake

The Homestake Mining Co., at Lead, S. Dak., the country's leading gold producer, has steadily increased its production since the government ban on gold mining was lifted a little more than a year ago. Operations currently are running about 50 per cent of capacity, but recovery per ton of ore is somewhat higher. It is estimated gross returns are around $800,000 to $1,000,000 monthly. This compares with a normal gross monthly return of about $1,500,000 to $1,600,000.

Homestake is still far short of labor, with about 700 men employed underground, whereas about 1,100 are needed.

Shaft Being Sunk on Vanatta Lease in Tri-State

Fred J. Childress and L. L. Smith of Joplin are sinking a shaft 425 ft. deep on the 160-acre Vanatta lease near Melrose and bordering the Kansas-Oklahoma state line and six miles west of the Picher field. More than 30 churn drill holes have been put down on the tract in the last two years, eight to ten of them by the U. S. Bureau of Mines.

Harold Childress, who will be in charge, states that the average assay of drill cuttings ran about 5 per cent in recoverable zinc and lead. A 12¼-in. drainage hole is now being finished near the site, to which a road will have to be built. A 10-in. Pomona turbine pump with 12-in. bowls will be installed in this hole to handle the heavy flow expected.

Profit-Sharing Plan Announced

Booklets containing the original text of a summary of Butler Brothers profit-sharing trust agreement are now ready for distribution. Those who on April 30, 1946, have been employed by the company for 24 consecutive months are entitled to participate in the benefits. The purpose of this plan is to enable participating employes to share in the profits of the corporation so that eventually a monthly income may be provided for each of them when he retires at the age of 65. The First Trust Company of St. Paul, Minn., is trustee of this fund and hereafter on April 30 of each year 25 per cent of the profit-sharing earnings of the company for the preceding fiscal year will be contributed to the fund by Butler Brothers. The amount of retirement income for each person will be governed by his earnings and those of the company, and the length of his service after the above date. The plan is not intended to be a substitute for wages or salaries.

New Shaft Underway Near Baxter Springs

The MacArthur Mining Co. is sinking a shaft on the Sparlin land three miles west of Baxter Springs, Kans. The lease, which comprises a quarter section, is opposite the company's two original mines on the Embry 160-acre tract. It is planned to extend the shaft to a depth of 410 ft. into the sheet ground but the upper run of ore from 325 to 335-ft. levels will be the first mined. Extensive drilling has been done on the property during the last few years. J. W. Hoffman of Joplin is the general manager of the property.

Parmanco
MECHANICAL FEED
HORIZONTAL DRILL.

Heat-treated gears are used in this transmission and spur gear reductions, with an ample factor of safety for the operation of machine under all conditions. Link-Belt bearings of extra size are used throughout. Augers are connected to main drive shaft through a self-aligning chuck of ample size, in which is secured the drive shaft by two shear pins which provide sufficient safety to rest of machine. The machine is raised or lowered to a height of 36 inches by jacks on front of machine, and rear of machine is mounted on two pneumatic-tired wheels which also have a 36-inch range of adjustments. The machine permits the drilling of a controlled-angle hole, which makes possible a great saving in the use of explosives through the cantilever effect of this controlled-angle drilled hole.

TRACTION EQUIPPED

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

Large Tin Dredges Being Built for the Dutch

The second of the two super tin dredges being built in the United States for operation in the Netherlands East Indies was launched at Tampa, Fla., early in January. This dredge will be towed 15,000 miles through the Panama Canal and across the Pacific, to its destination in the East Indies. This is believed to be the longest towing operation ever undertaken by an American firm, the Moran Towing and Transportation Co., Inc., of New York. The dredge will be put into operation on Banka Island, principal of the East Indies tin-island group, comprising Banka, Billiton and Singkep. These islands are the world's second most important source of tin; in 1941, they produced 51,000 tons out of a total world production of 246,000 tons. The Netherlands East Indies government is planning tin production to above the pre-war level in order to keep pace with the world's increasing demand.

Wheels of Government

(*Continued from page* 41)

cised by the Army-Navy Munitions Board.

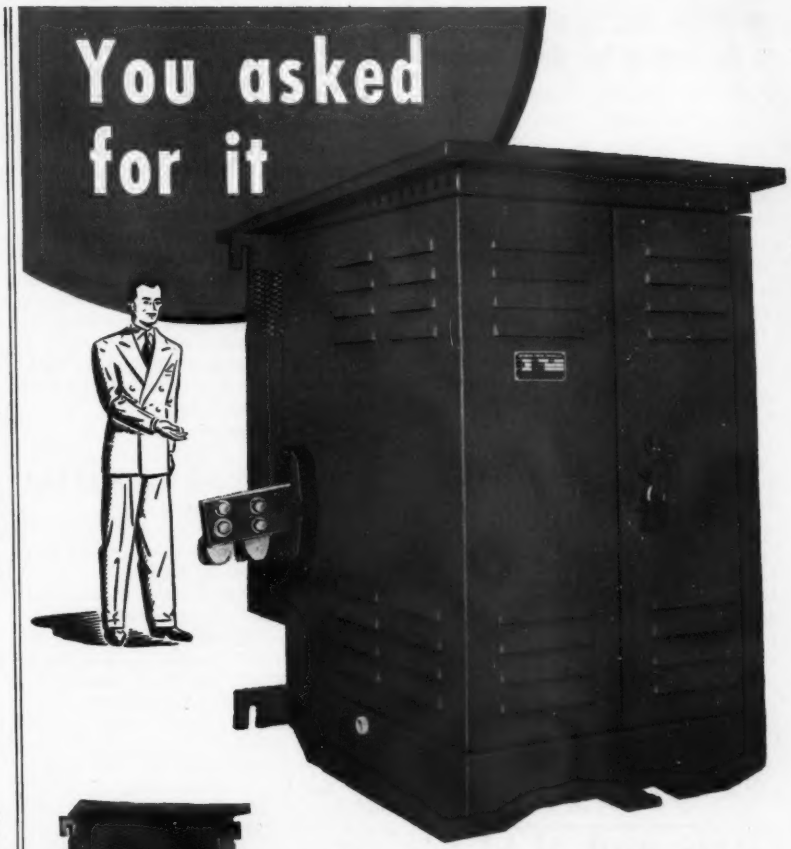
Freight Rates

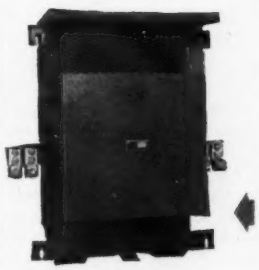
Effective January 1, the railroads and water carriers were granted an increase in freight rates averaging 17.6 per cent, replacing the emergency increases granted June 20, 1946, averaging 6.5 per cent. Continued permanently is the 10 per cent increase in passenger rates. No increase was made in iron ore rates in the Upper Lake Superior region.

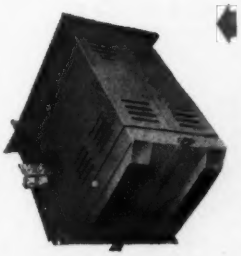
Anthracite and bituminous coal and coke were increased 15 cents per net ton or 17 cents per gross ton up to basic rates of $1 per ton; 25 cents per net ton or 28 cents per gross ton on basic rates over $1 and up to $2.25 per ton; and 30 cents per net ton or 34 cents per gross ton on basic rates over $2.25 per ton; lignite was increased by one-half of the amount authorized for anthracite and bituminous coal.

Wanted

Chief Assayer for mine in Northern Michigan thoroughly familiar with determinations of copper mine mill smelter products including precious metals and usual impurities. Salary, $300-$350, depending on experience. Write, giving experience, to Mining Congress Journal, Box R.







And here it is—the newly improved I-T-E Type KSC Automatic Reclosing Circuit Breaker.

It is *compact*, for use in low ceiling mine sections—*portable*, for ease in relocating.

Load resistors and housing are mounted at the rear of the sheet steel enclosure minimizing over-all height to only 38⅝ inches.

Steel attaching bar and new, channel-type steel skids make relocating the circuit breaker a simple pulling operation.

Your mine, equipment and personnel need no longer go unprotected against fires and explosion resulting from electrical disturbances. These new features, *coupled with* proven efficiency, make the I-T-E Type KSC Automatic Reclosing Circuit Breaker ideal for use in your electrical distribution system.

Send for Bulletin 4611 giving complete details on this equipment to

I-T-E CIRCUIT BREAKER COMPANY
19th and Hamilton Streets
Philadelphia 30, Pa.

SECTIONALIZING SWITCHGEAR

American Zinc, Lead and Smelting Company to Operate in Quebec

A new zinc refinery capable of producing 100 tons of high grade zinc a day and 70,000 tons of sulphuric acid a year, plus cadmium, will be built at Arvida, Quebec, by the American Zinc, Lead and Smelting Co.

The cost, including one million of working capital, will be $10,500,000 and the plant is to be in production early in the spring of 1948. It will use concentrates from Eastern Canada mines, will ship metal into the United States under quite favorable freight rates and will be in an excellent position to ship into the European market. A 15-year exclusive right to treat customs offerings in the Province of Quebec, dated from commencement of operations, is a feature.

The plant will be entirely new. Installation of equipment is expected to start early in 1947, with production scheduled for the spring of the following year. Aluminum Company of Canada will rent to the new enterprise its Red Mud building at Arvida, erected during the war and used in tailings treatment. This building is reported as ideal for the zinc plant. Alcan is supplying power from Shipshaw at what is said to be a very attractive rate. It is supplying the zinc plant with compressed air and machine shop facilities so that these will not have to be otherwise provided for the operation of the zinc plant.

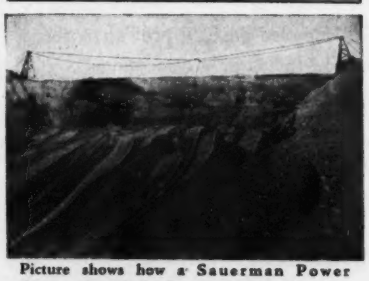
Howard I. Young, president of American Zinc, Lead and Smelting Co. of St. Louis, will be president of the new Canadian company. At the moment the American Zinc, Lead and Smelting Co. is providing 51 per cent of working capital and will direct the enterprise. Golden Manitou Mines, Ltd., is acquiring the remaining 49 per cent of the common stock. Harry W. Knight, president of Golden Manitou, will go on the board of the new refining company.

New Officers Elected to Indiana Coal Society

New officers and directors of the Indiana Coal Preparation and Utilization Society were elected at the December meeting of the organization held at Terre Haute. M. A. Matthews of the firm of Templeton-Matthews Corp., consulting and designing engineers of coal preparation plants, was elected president; William R. Caler, Enos Coal Mining Co., vice president; Roy Ault, Shasta Coal Co., vice president; and C. C. Lydick, managing director, Coal Trade Association of Indiana, secretary-treasurer.

The society, organized in 1944, is a pioneer association formed for the purpose of promoting improved preparation methods and of furthering the proper utilization of Indiana coal. Each year it has sponsored a series of meetings, the programs of which have been devoted to authoritative talks on subjects of special interest to the coal industry.

DIG and HAUL
the SAUERMAN *Way*



Picture shows how a Sauerman Power Scraper at nickel mine in Canada digs into hill and moves material down to a raise to backfill a worked out stope.

You can move any loose materials—coal, ore, sand, gravel, clay—fast and efficiently with a Sauerman Power Scraper. One man handles the entire operation through simple automatic controls. Operating range is easily extended. Sturdily built for long, low-cost service. Electric, gasoline, Diesel or steam power.

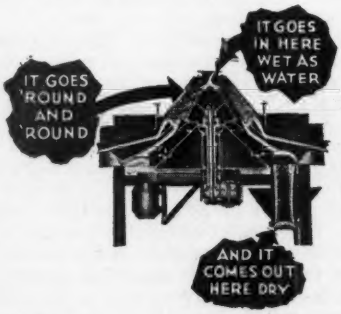
SAUERMAN BROS., Inc.
540 South Clinton St. Chicago 7

Wanted to Buy

TWO No. 212-AA
or, as an alternative
TWO No. 12-AA
Goodman Cutting Machines
Used but in good operating condition, for use with 250-volt direct current.
Address replies to Box "L," care of Mining Congress Journal.

ONE No. 7 BU
or, as an alternative
ONE No. 5 BU
Joy Loading Machine
Used but in good condition, fully equipped and with 35-hp. Standard Reliance Motor, for use with 250-volt direct current.
Address replies to Box "D," care of Mining Congress Journal.

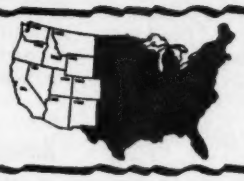
FOR the most economical and simple method for dewatering and drying the smaller coal sizes. The many installations in modern coal washing plants are proof of this. We shall be glad to give you the details of the installations.



Sludge and slurry coals are also being reclaimed by using this machine. Where a large part of the ash is in the finest sizes, ash content as well as the water content is reduced.

Centrifugal and
Mechanical Industries,
INC.
3600 South Second Street
St. Louis 18, Mo.

Western States



Nevada Placer Gets New Dredge

Preparing for a large-scale placer operation in the Rabbit Hole section of the Rosebud placer district in northern Pershing County, Nev., the Poston Picher Corp., under management of U. L. Poston of Kalispell, Mont., is installing a 6,000-cu. yd. dragline dredge and gravel washing plant on ground leased from Reno owners.

During the past eight months a mobile pilot test plant has been operated, handling from 240 to 400 cu. yds. a day on one shift. Results were said to be sufficiently encouraging to warrant installation of the larger plant.

Mill Being Remodeled North of Wallace, Idaho

The Monitor Mining Company is remodeling the Ray Jefferson mill on Beaver Creek for treatment of zinc-lead ores from several Monitor company mines in the Beaver district. The ores have heretofore been trucked to custom milling plants in Wallace. The Monitor Company has recently completed a long crosscut tunnel connecting its Carlysle tunnel on Beaver Creek with the old Interstate-Callahan mine at the head of Nine Mile Canyon, which the Monitor Company recently purchased.

Gold Mine Purchased in Idaho

The Crown Point Mining Company has purchased the Four Square gold mine and mill on Prichard Creek in the Murray district from the Trinity Trust Company and will make additions to the plant to convert it into a custom mill for the treatment of both gold and silver-lead ores. The Four Square mill represents an original investment of $300,000.

Helicopter Service to be Available for Arizona Geologists

Helicopter service for Arizona geologists and mine operators will be inaugurated soon, according to an announcement by the Arizona Helicopter Service. Delivery of the first helicopter was scheduled for November 29. The company headed by Edwin J. Montgomery, is a subsidiary of Southern Arizona Airlines currently engaged in regular charter work with standard airplanes.

The helicopter may be a helpful tool for geologists and geophysicists in their studies of earth formations. It also will provide a means of rapid transportation to remote districts and inaccessible places.

Plans Completed for Meeting

The Colorado Mining Association has completed plans for its meeting in Denver, February 6, 7 and 8, in conjunction with the Golden Anniversary of the Colorado Mining Association. Under the leadership of B. T. Poxson of Creede, Colo., a comprehensive program is being arranged. The committee has enlisted the support of mining experts, economists, scientists, geologists, monetary experts, Federal and state officials and others engaged in many lines of business connected with mining.

Among the subjects which will be discussed will be: economic future of the West; national and international requirements for metals; future of gold and silver in our national economy; new developments in mining and milling methods; latest methods in the study of underground ore bodies; and topics of kindred nature of interest to the mining industry.

Governor-elect Lee Knous is sending invitations to Western Governors to attend this meeting and a special luncheon has been arranged for Hon. John W. Snyder, Secretary of the Treasury, who will address the Sowbelly Dinner on Saturday evening.

Shaft Being Sunk for Montana Phosphates

A new vertical shaft is being sunk at the present time for the Phosphate Products Co., by E. J. Longyear Co., contractors. The phosphate operations are located seven miles from Garretson, Mont. Sinking operations at the new shaft are now down over 100 ft. from surface and will advance to the ultimate depth of 450 ft.

Canadian Firm to Develop Property

An Oregon mining area is now staked out for new development by the Consolidated Mining & Smelting Co. of Trail, B. C., Canada. Mining specialists have been stationed for the purpose at Sumpter, Oreg., and will handle this project for the company. Operations are being developed under the name of the Solar Development Company.

"THE BLUE BOY," BY GOLDSBOROUGH
. . . Bruce Russell, in the Los Angeles Times

Annual Report of New Mexico Bureau of Mines Issued

The annual report for the year 1946 dealing with the status of New Mexico Minerals Industry has just been released by E. C. Anderson, director of the New Mexico Bureau of Mines and Mineral Resources. Incorporated within the publication is the 34th annual report of the State Inspector of Mines giving mineral production statistics for the year ending October 31, 1945.

Cripple Creek Reports New Production

Merrill E. Shoup, president of the Golden Cycle Corporation, reported early in December that workers on the Anchoria-Leland mine opened up what appears to be an important discovery on the 300-ft. level. This mine is owned by Golden Cycle and is an old producer that until recently had been idle. The Ajax mine continues to produce a favorable tonnage. Ores are coming from a section of the property unwatered by the Carlton tunnel. Golden Cycle anticipated treatment of more ore in December than in November when 30,000 oz. of gold was processed at the mill. The prospects for 1947 are looking up in the Cripple Creek district and miners are moving back to the district as gold activity increases in the region.

RFC to Discontinue Lead Concentrator at Butte

The RFC announced termination, effective January 11, of its agreement with the Domestic Manganese & Development Co., for operation of the RFC-owned flotation mill at Butte, Mont., a custom mill for the concentration of lead-bearing ores. It is the only lead concentrator owned by RFC and will be subject to sale or lease by the War Assets Administration.

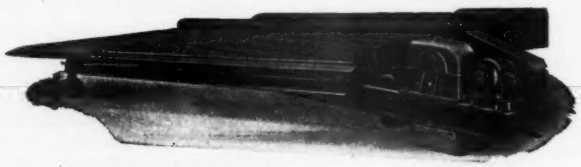
College of Mines to Hold Meeting in Seattle

The 20th annual meeting of the Mining Institute of the College of Mines, University of Washington, will be held in Mines Laboratory on the campus in Seattle on Thursday, January 16. The morning and afternoon sessions will consist of addresses and motion pictures on current affairs in the mineral industry, also demonstrations of new pieces of equipment. In the evening the Institute will hold a joint dinner at the Faculty Club with the North Pacific Section of the American Institute of Mining and Metallurgical Engineers, to be followed by an evening program prepared by the section.

The Prospectors' Course authorized by the Washington State Legislature began a new session on Monday, January 6. This will continue until March 20. These courses are open at very low cost to men past high school age. The daily instruction includes practice with prospecting and mining equipment, handling of ores and minerals in great variety, showings of motion pictures and views of current operations. Field trips are made on weekends.

Nevada Mine Opening More Ore

Getchell Mines, Inc., continues sinking its new three-compartment shaft at a point 3,000 ft. north of old workings where deep drilling revealed ore bodies of important dimensions with small arsenic content. A crosscut is being driven to the ore



The Profitable Way to Separate Ores

Whether your problem is one of simple concentration, or whether yours is a difficult separation of a complex ore, SuperDuty Concentrating Tables make your operations more profitable.

More profitable because SuperDuty's exclusive diagonal deck increases capacity while yielding, also, higher grade concentrates and leaner tailings, a minimum of middlings for recirculation . . . therefore higher extraction of values.

More profitable because SuperDuty's underconstruction is built in and prealigned for you at the factory . . . eliminating certain expensive installation costs or subsequent unnecessary upkeep.

More profitable because of low power requirements and economical operation. One easily trained operator can supervise a large battery of SuperDuty tables.

Write today for Bulletin 118-A and full information.

Concenco Feed Distributors

The Concenco Revolving Feed Distributor is a heavily fabricated all steel machine, built in various types, with motor drive requiring less than ¾ H.P. in operation. This distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions. It is especially suitable for efficiently feeding a battery of concentrating tables, giving an equal distribution of feed to each table.

THE DEISTER ★ CONCENTRATOR COMPANY 910 Glasgow Ave. ★ Fort Wayne, Ind., U.S.A.

CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

zone on the 300-ft. level 600 ft. below the apex and surveys indicate the ore will be cut in the shaft at 1,200 ft. Capacity of the cyanide mill has been increased from 1,000 to 1,500 tons per day and equipment of the 600-ton scheelite concentrator has been removed.

Mercury Plant Closed

Because of the low price of mercury, the 80-ton furnace plant at the Cordero mine near McDermitt on the Nevada-Oregon border closed on December 1. Mine development work will continue with the reduction of working force. During the war the Cordero mine produced about 50 flasks of quicksilver per week.

California Copper Property May Resume Production Soon

The Plumas Mining Co. is planning to resume operations at the Walker mine near Portola. The new organization has received a quota of 352 tons of copper per month from the government and it is planning to employ 100 men when sufficient labor is available. The Walker mine was California's largest copper producer during the prewar period and at that time operated as a subsidiary of Anaconda Copper Mining Co. The present manager of the property is R. P. Wilson.

Arizona Mine Will Have New Mill

Near Courtland, Ariz., rehabilitation of the Great Western property has been undertaken by Southwestern Mines, Inc., a new concern organized for this purpose. A mill of 250 to 300 tons capacity is contemplated.

Prior to 1920 the Great Western, consisting of 23 patented claims, produced 176,450 tons of ore. Metal content, mostly copper, had a gross value of $1,966,517. Vincent Ricardi of Phoenix, owner of the group, has granted a lease and option to Southwestern.

Ohio Copper May Expand Utah Operation

The District Court of Moab, Utah, recently approved the sale of four copper claims belonging to the Frank Silvery estate to the Ohio Copper Co. This company is operating a concentrating mill at Big Indian. It may expand operations by mining and milling ores from Lisbon Valley, some ten mile distant where the new claims are located. R. J. Fletcher, executor of the estate, authorized the transfer of the property to the Ohio Copper Co.

Placer Mining Planned for California Property

Hydraulic mining operations will be started early this year if sufficient crew can be assembled at Omega hydraulic mine near Nevada City, Calif., by Goldfield Cons. Mines Co., of San Francisco and Reno, Nev., which recently purchased the noted gold producer from Massachusetts interests.

Cadmium and Silver Production Continue from Mt. Hope

Callahan Zinc-Lead Co. now has 85 men employed at the Mt. Hope-Eureka unit, 26 miles north of Eureka, Nev. The mill is on three shifts handling 200 tons of ore daily. Cadmium and silver are the principal products recovered by selective flotation. Recent diamond drilling has located additional ore which is now being developed. Ore is mined on two levels by tunnel.

SEALTITE TAMPING BAGS

TIME SAVED--TONNAGE INCREASED
By Mines Using TAMPING BAGS

Many mines have found it good business to supply their shot-firers with "packaged" tamping material (Tamping Bags filled with sand, clay or rock dust) because they have found that tamping time is reduced and better tamps made.

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Independent Pneumatic Expands

Independent Pneumatic Tool Company of Chicago, manufacturer of Thor portable pneumatic and electric tools, announces a $1,000,000 expansion of its main works at Aurora, Ill.

Site for the expansion has been cleared adjacent to the company's main plant, according to Neil C. Hurley, Jr., president, and construction of the annex, which will provide 85,000 sq. ft. of additional floor space for production purposes, will begin shortly.

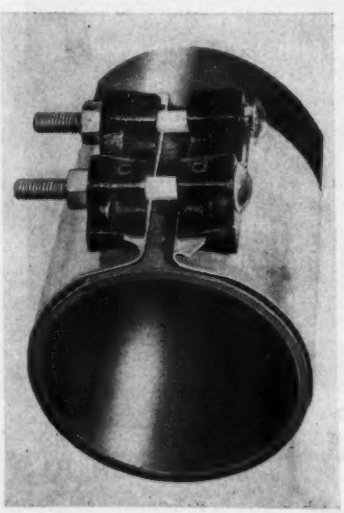
Mr. Hurley further announced the expanded facilities are planned for production of new Thor products in both the automotive and farm markets, including electric saws, high frequency electric tools, pneumatic hammers, valve refacers and hard seat grinders.

The building program is the latest and major step of Thor expansion during 1946 which has seen the company's chain of factory branch offices extended to 20 with the opening of new branches in St. Paul, Denver, Cincinnati and Houston.

Only partially successful in its effort to keep hard-to-get track-type tractors at home where they are badly needed in the construction, lumbering, housing, mining and agricultural industries, Caterpillar Tractor Co., Peoria, Ill., ships 42 of these scarce machines to the Russian states of Byelorussia and the Ukraine. An industry protest to C. P. A. opposing their orders for U. N. R. R. A. resulted in a 50 per cent reduction in original quotas, but it is expected that C. P. A. orders will still draw off more than 7,000 track-type tractors from domestic supply lines

Pipe Leak Repair Clamp

A new pipe leak repair clamp has been introduced by Smith-Blair, Inc., of South San Francisco, Calif. According to the manufacturer, this clamp has features which make sealing-off of leaks in pipe lines quick and as permanent as the line itself.



Sizes now produced are for pipe from ½ to 30 in. in diameter; and it is adapted for all types of metallic pipe and for asbestos-cement pipe. The clamp has a copper band sleeve which gives about 100 per cent wrap-around without using a "tongue."

A unique feature of this design is the cast lugs which can be reduced in length for 30-in. sleeves down to 3-in. sleeves in even multiples of 3 in.

"Pedrifugal" Pump

The Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces a new line of "Pedrifugal" pumps, developed at its Norwood Works, to meet the needs of an unusually wide range of users who require a sturdy, reliable pump of moderate capacity selling at a competitive price.

This new line of cast-iron bronze-fitted, pedestal-type centrifugal pumps comes in three principal sizes — 1-in. by 1-in., 2-in. by 2-in. and 3-in. by 3-in. Capacities are from 10 to 500 gal. per minute at heads from 10 to 100 ft., with power requirements from ¼ to 15 hp. These pumps are expressly designed for use with Texrope V-belt drives, giving an infinite range of capacities regulated by size of sheaves and power supplied. All are fitted with impellers of maximum diameter, and variations in capacity are provided by changes in speed through sheaves of larger or smaller diameter.

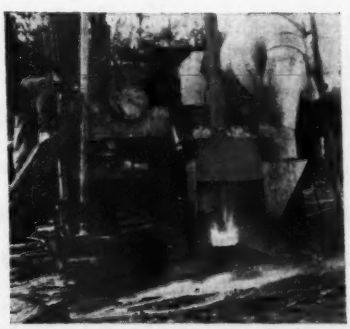
Construction features embody the following: Only one fit—that between the pedestal and the casing—and open impeller keyed to the shaft and fitted with an impeller lock nut, which will handle liquids containing a considerable volume of solid material; a precision-made, mechanical seal, instead of the conventional packing rings, seal cage and valve; two bearings of ample size for either direct or belt drive; and, except for impeller and casing, the same pedestal casting, shaft, ball bearings, seal and impeller nuts for all capacities.

FUSION PIERCING

A NEW method of making vertical blast holes in hard, low-grade iron ore, called for fusion piercing, has recently been tested on the Mesabi Iron Range. Increases in drilling speeds of ten times that of older methods have been accomplished.

In fusion piercing a flame, produced by burning oxygen and a flux-bearing fuel in a special blowpipe, is directed against the surface of the rock or ore. The high flame temperature—about 4,000 deg. F.—causes some kinds of rock to spall or flake off. Flux in the fuel causes other kinds of rock to melt. Pressure of the burning gases forces the molten material past a water spray where it is quenched and broken up. In the quenching process water turns to steam and the steam helps the

The experimental fusion-piercing rig set up ready for a test run. Oxygen is supplied by the cylinders on the truck at the left

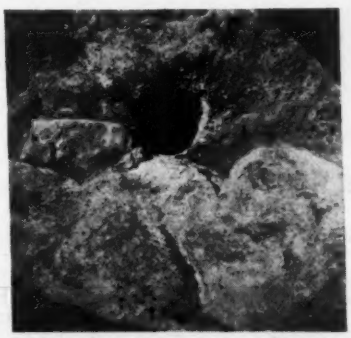


The fusion-piercing blow pipe coming out of the hole at the end of a test run

gases force the quenched material out of the hole. Fusion piercing is a patented process and was developed by the Linde Air Products Company, a unit of Union Carbide and Carbon Corporation.

Equipment for commercial use is still in the development stage. For field tests a truck was equipped with a portable oil-field drill rig with the 30-ft. special blowpipe replacing the "kelly," and pumps, tanks, motors and special recording instruments. A more compact and less complicated commercial machine will result when the apparatus that is on the experimental rig solely for the purpose of collecting data is eliminated. It is expected that commercial machines will be operated by a full-time operator and a part-time helper.

Field tests were made on Minnesota "taconite," an extremely hard, tough, abrasive, low-grade iron ore. Six-inch diameter holes up to 30 ft. deep were fusion pierced at an average rate of 10 ft. per hour, with rates as high as 17 ft. per hour for short periods. This compares with an average speed of about 1 ft. per hour for drilling holes of similar diameter in this ore.



A 30-foot blast hole 6 in. in diameter produced by fusion-piercing

Speed in making blast holes helps reduce mining costs in large-scale operations. In addition, it has been found that the high-temperature piercing flame produces stresses in the surrounding ore which cause better fragmentation during primary blasting, further reducing costs. Mining men who saw the tests say that fusion piercing will have many advantages in the mining of low-grade ore.

—*Announcements*—

Herbert H. Smith has been promoted to sales agent in the mine and industrial division of **National Malleable and Steel Castings Company**, with headquarters in Cleveland, Wilson H. Moriarty, vice president in charge of sales, has announced.

Mr. Smith, who has been a field engineer for National Malleable since 1945, joined the company's engineering department in Cleveland in 1937. He was graduated from Fenn College in 1934 with the degree of Bachelor of Science in mechanical engineering.

* * *

After 26 years of service, Albert C. Walsh, purchasing agent, has retired, according to a recent announcement of **The Timken Roller Bearing Company**, Canton, Ohio.

Walsh, who was born and raised in Elyria, Ohio, joined the Timken firm when it purchased the assets of the Gilliam Manufacturing Company, with whom Walsh was then employed.

He plans to spend his retirement at his favorite sports, golfing and fishing, and at his hobby, gardening.

* * *

Kennametal, Inc., Latrobe, Pa., announces appointment of three representatives to sell and service Kennametal mining tools in Illinois, Indiana and Kentucky.

John E. Noel, 208 Mitchell Street, Benton, Ill., will operate in the northern half of Illinois.

Harry McKee, Gish Apartments, Central City, Ky., will cover the state of Indiana.

M. C. Haley, 130 E. Broadway, Madisonville, Ky., will cover all Kentucky counties except those in the southeast section of the state.

CATALOGS AND BULLETINS

DIAMOND DRILLING. *E. J. Longyear Co.*, Minneapolis, Minn. This concern has just published a 27-page booklet entitled "Bibliography of Diamond Drilling." The bibliograph is most comprehensive and covers papers on diamond drilling delivered before the American and foreign technical sources as well as articles on diamond drilling in various mining publications. Some of the topics covered are: costs, surveying and deviation of drill holes; application and purposes of drilling, standards and specifications for diamonds and other cutting media.

JACKS. *Duff-Norton Manufacturing Co.*, Pittsburgh, Pa. Catalog No. 203 describes a complete line of lifting jacks, a ratchet, screw, air motor, and hydraulic type as manufactured by this concern. Also shown are drills on the Automatic Lowering Mechanism and improved Journal Jacks; and a new 50-ton general purpose screw jack of the inverted type. The catalog is 40 pages in length with photographs and descriptive material on each piece of equipment. A convenient table on the last page of the catalog gives dimensions for the various types of jack.

POWER. *Allis Chalmers Manufacturing Co.*, Milwaukee, Wis. This new 32-page booklet is entitled "More Power to U. S. A." It describes the company's products commonly used on generating, sub-station, transformers and distribution systems. The booklet presents Allis Chalmers equipment available for power generation and distribution, ranging from steam and hydraulic turbines, Turbo generators, engine-type generators and condensers and auxiliary to pumps, water conditioning, motors, motor control, switch gear, circuit breakers, power and distribution transformers and unit sub-station. The booklet is profusely illustrated with photographs and cut-away diagrams.

SLUSHER HOIST. *Ingersoll-Rand Company*, Phillipsburg, N. J. This descriptive bulletin covers the complete line of slusher hoists including "utility" and "tugger" hoists of one to three-drum capacity. The catalog is profusely illustrated with photographs and diagrams showing the application of the hoists and possible hook-ups. Several pages are also devoted to air tools and accessories.

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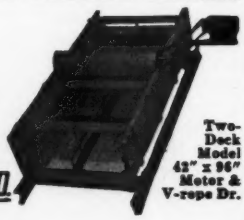

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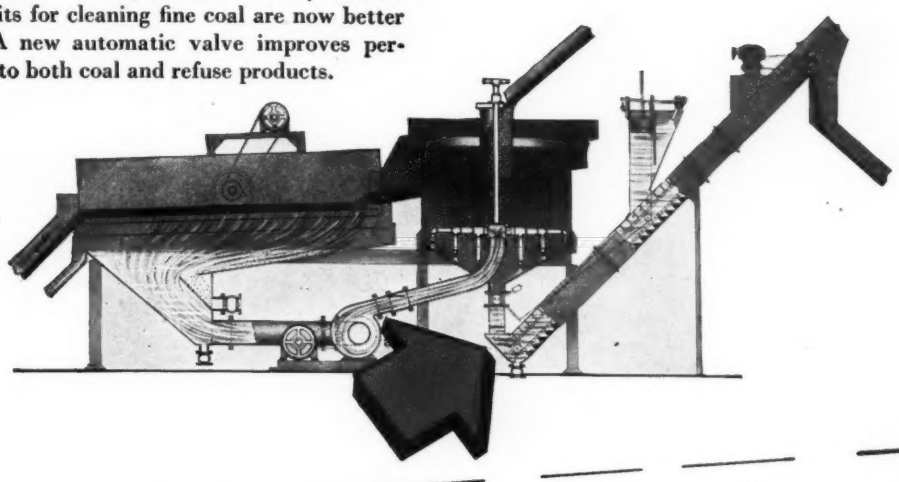

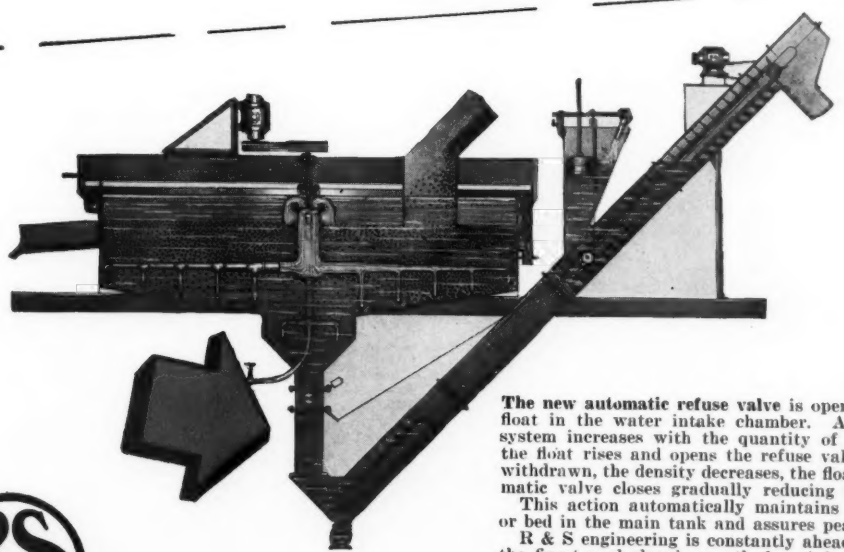

The new automatic refuse valve is operated by cable from a float in the water intake chamber. As the density of the system increases with the quantity of refuse in suspension the float rises and opens the refuse valve. As the refuse is withdrawn, the density decreases, the float drops and the automatic valve closes gradually reducing the refuse discharge.

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